MAINTENANCE ISSUE

April 17, 1926

McGraw-Hill Publishing Company, Inc.

Twenty Cents per Copy

ELECTRIC RAILWAY JOURNAL

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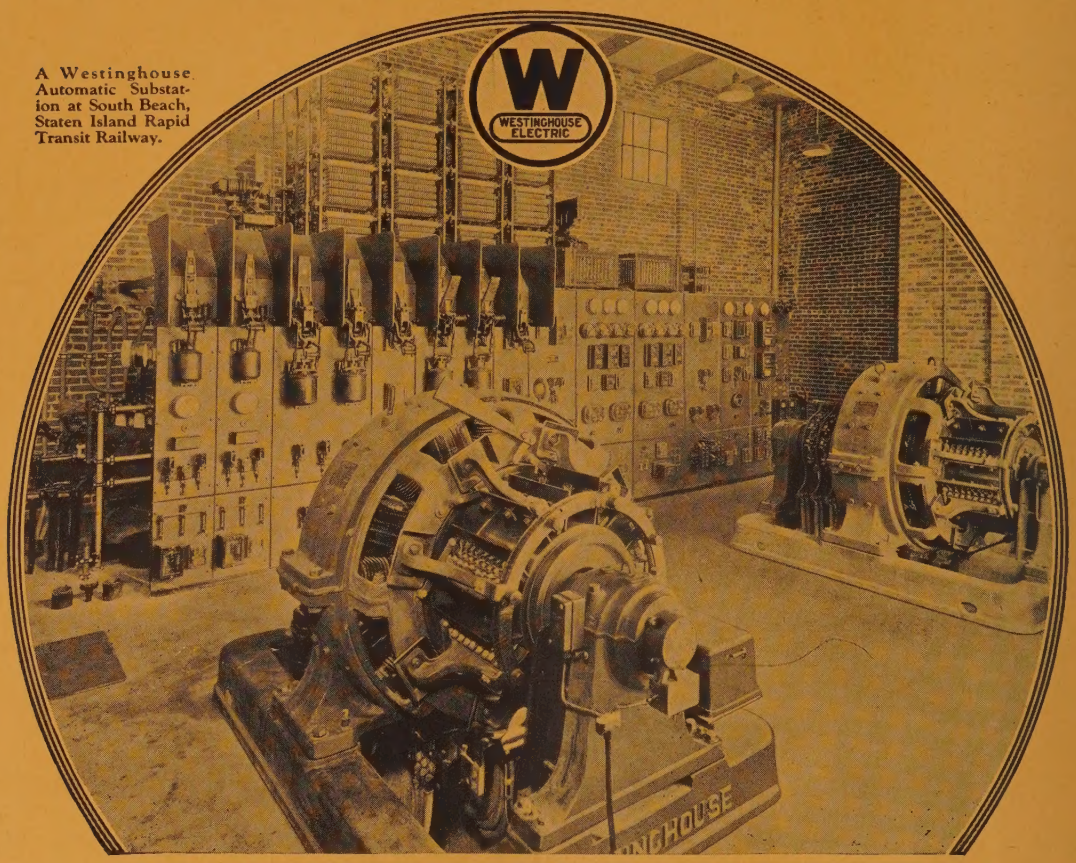

A Westinghouse Automatic Substation at South Beach, Staten Island Rapid Transit Railway.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 67 New York, Saturday, April 17, 1926 *Number* 16

A Forward-Looking Viewpoint on Maintenance

UNQUALIFIED indorsement is registered by many chief executives of the viewpoint expressed in the Annual Maintenance Number of the JOURNAL published on March 20. In the issues of April 3, April 10 and on another page of this number letters are published from executives commending the forward-looking point of view from which the maintenance man's part in selling transportation was presented.

There is cause for deep gratification in all of this. Sometimes there is a feeling among maintenance men that they are somewhat sidetracked in the general discussion of measures for improving the status of the industry. Again, there is some tendency to question the foresight and imagination of those charged with maintenance supervision. It would be imitating the ostrich to deny that there has in a measure been cause for some of this feeling both inside and outside the executive office. But from the point of view expressed in this maintenance number, it is clearly evident that many of those responsible for the upkeep of the physical property are keenly alive to the modern conception of railway service and to the important part which the maintenance man must play. On the other hand, the letters which have come in from executives show that the man in the inner office is enthusiastically ready to recognize and to support such progressiveness.

Here is represented the ideal meeting of minds—the concrete evidence of the new spirit of co-operation and the new *esprit de corps* that is permeating the industry. It speaks well for the future. In years to come, when we look back along the grade up which the industry is now traveling with increased momentum, it is the hope of the JOURNAL'S staff that this issue will stand out as one of the milestones in the march of progress.

On every hand there is growing evidence of this progress. The broadening demand for new and improved equipment, interest in the better maintenance of existing cars, track and power facilities, and a tendency by executives to expand maintenance budget allowances so as to permit the acquirement of better tools and the closer supervision of the condition of equipment are all leading in the same direction—improved service. That, in turn, will help to build public confidence and friendliness. Here lies the source from which come improved franchise conditions, more adequate fares, relief from unfair tax burdens and other fundamental measures required for the adequate development of local transportation. The industry is on a cumulative cycle of improvement. It should be an inspiration for maintenance men to read the views expressed by Messrs. Budd, Coates, Thompson, Draper, Reid, Dana, Wallace, Buffe and Holden relative to the part which maintenance plays in the general scheme. Mr. Storrs said recently that the industry needs to look more to the future and less to the past. Here indeed is evidence of a forward-looking viewpoint.

Quality of Maintenance Work Affects Prestige of Entire Industry

RESPONSIBILITY for the good or bad opinion which the public has of the electric railway rests heavily on the maintenance men. Neglected maintenance of track and rolling stock naturally tends to create an impression of obsolescence. The public has heard it said that the day of the street car has passed. When the average man looks around him and sees neglected track and poorly maintained cars, he is inclined to believe these gloomy forecasts. If the company is not spending any considerable amount of money on the upkeep of equipment, he thinks the reason must be that it is acknowledged to be obsolete.

Impressive figures of the number of passengers carried annually by electric railways presented to show the essential character of the industry convince the public not at all in the face of clear evidence of failure to maintain the physical property. People in one town seldom know anything about electric railway conditions elsewhere. They judge by what they see with their own eyes. One dilapidated car at home does more damage to the prestige of the industry than can be repaired by a hundred new cars in some other city. One neglected piece of special trackwork in the neighborhood outweighs a dozen miles of smooth, quiet track somewhere else.

The work of the maintenance man, therefore, has an effect a good deal more far-reaching than is realized in all cases. Not only is it an important factor in the economical operation of his own property, but the thoroughness of its performance has a vital bearing on the esteem in which electric railways in general are held by the public.

Noise as an Indication of Inefficiency

EXCEPT for warning devices, such as the whistle or gong, noise is not included as a desirable factor in the design of any transportation apparatus. Any noise which is found in the operation of a new system is there of necessity rather than choice. Looking at the source of such noise, in the final analysis it will be found the mark of inefficiency.

Complete elimination of noise, even in new equipment, is practically out of the question, not because it is impossible to build devices that operate with perfection, but because the cost of doing so is prohibitive. It is remarkable, though, how closely this ideal may be attained in commercial designs. The new car or the

This is the issue in April that is devoted essentially to maintenance subjects

new bus, running on a good track or a smooth highway, operates with so little noise that it is seldom criticism comes on that score.

It is not so easy to keep down the noise as the parts wear and the equipment becomes older. Devices have not been developed that do not wear, and wear itself means looseness, with the inevitable chattering and vibration. Naturally, the longer the parts are allowed to wear without adjustment the greater become the clearances and the more the resultant noise. Here again it is a question not of the impossibility of getting rid of noise more or less completely by restoring parts to their original condition, but of the cost of doing so.

Standards set up by the public with regard to allowable noise have changed greatly in recent years. Assign what cause to this one will, it is a fact that the public will not tolerate noises that once were accepted as a matter of course. The importance of reduction of noise as an asset in merchandising transportation never can be overemphasized. Lack of attention to noise reduction today brands the company as non-progressive and makes it just so much more difficult for the management to maintain relations with the public on a satisfactory basis.

Attention was called in the maintenance issue last month to methods of noise reduction that are applicable in all departments of the railway system. Equipment, track and line all contribute to the production of noise, and in each there is possibility for improvement. In general it may be said that the remedies proposed are easy of adoption, and the expense of reducing noise to the point where most of the criticism will be silenced is not prohibitive. Furthermore, use of such methods inevitably will lead to a reduction in their cost and may even result in lower total maintenance costs for the system.

Planning for Special Devices Will Increase Their Effectiveness

PRACTICALLY every railway system has a number of special machines and other pieces of equipment which have been installed to facilitate the work of maintenance. As a rule, these devices have been added from time to time as the funds of the company permitted. Often they have been placed wherever there was a vacant space in which to put them. This is true particularly in the case of shop equipment. In a shop well planned for production, it is the general practice to arrange the equipment so that from the point where the car is dismantled the work will be routed in progressive order to the point where the parts are assembled again after their repair. In this way the time consumed in handling is reduced to a minimum.

Case after case will be found where at one or more points the progress of the parts under repair will be delayed by inadequacy of the machines, or capacity that will not care for the volume of work to be handled. Such a lack will be reflected in the entire progress of the overhauling. Cars will be held in the shop longer than necessary and the assembling tracks will be crowded on account of this inability to perform a certain operation. This also results in inefficient use of labor in most cases. Workmen will be held idle awaiting the arrival of parts that are vital to the assembly. The offending department will be subjected to abuse, but unless a readjustment can be made there is no remedy for the condition.

Sometimes a study of the shop layout will show that it is possible to make changes that will permit a great deal more work to be turned out by certain parts of the shop equipment, thus removing the limitation. For instance, the difficulty may be that the equipment is not properly placed, so that there is delay in getting the parts delivered or taken away, allowing the product to choke itself. In one case, that of three baking ovens, it was found that the method of storing armatures in the ovens themselves was inefficient, and the methods of handling the armatures resulted in interference. With relatively minor expenditures the capacity of these ovens was increased 62 per cent.

The illustration cited is only one of many, although the increase in capacity was striking. Study given to the particular problem in any shop will undoubtedly bring to light instances where improvements can be made that will not only make the work easier, but will remove limitations that seriously hamper the quick repair of equipment.

Successful Executives of the Future Will Come from Engineering Professions

DEVELOPMENT of engineering as a factor affecting the management of business and industry has now progressed to a point where a majority of the important decisions probably are controlled by technical considerations. While other factors enter into these decisions, in many cases engineering has become the most influential. This was emphasized at a recent joint meeting of the four major engineering societies, when the discussion centered on the subject of qualifying the engineers for executive positions.

Since no one individual can be expected to be thoroughly familiar with all the various factors—legal, financial, technical and others—which must be considered in the determination of matters of business policy, he must rely to some extent on the advice of others. But the executive should have intimate personal knowledge and experience along at least one of these lines, and preferably that most important in his business. In industries where engineering considerations predominate, therefore, it may reasonably be expected that a majority of the successful executives of the future will be drawn from the ranks of those who have had engineering training.

Advantages likely to result from the selection of engineers for executive positions will be more readily appreciated in the light of the qualifications which the speakers at this meeting said a good engineer should possess. He should, without question, understand the fundamentals of his profession. Beyond that his outlook should be broad rather than highly technical. His course of study in college should include cultural subjects as well as purely scientific subjects. This was the unanimous opinion of men of such diversified interests as E. M. Herr of the Westinghouse Electric & Manufacturing Company; A. H. Guess of the American Smelting & Refining Company; Dr. F. B. Jewett of the American Telephone & Telegraph Company, and J. C. Parker of the Brooklyn Edison Company.

By the definition given by these prominent industrial leaders, a good engineer is far more than a mere tech-

nician. In fact, too much enthusiasm for technique was mentioned as a real obstacle in the way of success in engineering. Sound knowledge of the fundamentals of engineering, a broad outlook and just appreciation of relative values, and last but not least, an understanding of the human side of industry—these are the qualification of the good engineer. Thus equipped, he is well fitted for an executive position. Nowhere does this hold true more than in the electric railway field.

Modern Machine Tools and Shop Facilities Needed

QUALITY in repair work depends quite as much on the tools used as on the workmen themselves. It is manifestly unfair to expect workmen to take large cuts at high rates of speed on machine tools which have small capacity. The advent of high-speed steel has forced the designers of machine tools to provide increased capacity and increased production. Manifestly, old equipment cannot be made to perform with the same efficiency as these modern machines. Careful selection of small tools is also necessary, in order to obtain the degree of efficiency which modern shop equipment demands.

On most electric railways, funds available for betterments are limited and must be stretched to cover needed facilities in many departments. Many times, when the merits of a machine are recognized, it is felt that the interests of the railway and the public will best be served by the expenditure of available funds on facilities where the need is more urgent or which will create immediately a greater return.

It is time that railway officials realized that attractive, reliable rolling stock requires a first-class shop for proper maintenance and that the resulting reduced repair cost will help pay for any improvements made. Machine work should be substituted for hand work wherever possible. Proper routing of work to eliminate lost motion and speed repairs can usually be obtained by careful study of conditions and with little added expense. Carefully compiled cost records and an exchange of ideas and information with neighboring properties will enable officials to tell when costs are abnormal and to apply a satisfactory remedy.

Trackwork Has an Equal Right to a Place in the Sun

CLOTHES may make the man, but flat feet will make him thoroughly miserable. What more pathetic sight could be conceived than that of a nice shiny new street car leaping and bucking down a stretch of track that would bring tears to the eyes of an army tank driver? One hears on every side the chorus of pleas for modern, light-weight cars, neater uniforms for platform men, improved public relations—in short, for all of the factors which will make for success in the marketing of transportation. Yet, in fact as in word, the very basis for street car transportation is found in the trackwork and roadbed. It avails little to plan a great skyscraper if the foundations cannot be laid upon solid bedrock. It is equally futile to boast of improved service, riding comfort and modern transportation when the trackwork is in a chronic state of disrepair.

Very natural is the tendency, where funds are limited, to make expenditures in directions which will have the greatest effect in stimulating public good will. Up-to-the-minute rolling stock has an advertising value which cannot be overlooked. Perhaps Tom, Dick and Harry do not wholly appreciate the magnitude of the task involved in keeping trackwork up to par. They are not slow, however, to detect negligence in these matters on the part of the railways.

Smoothness and quietness of operation are factors which are usually judged in a negative way. Their absence is quickly noted and will generate a feeling of antipathy against the railway; conversely, their presence is taken for granted and not often remarked. But this negative reasoning is none the less important. It has been said that one knocker will accomplish more harm than eight boosters can overcome.

Too great emphasis cannot be placed on modernized rolling stock, whose influence is entirely positive. While the influence of proper track maintenance may not register so positively on the car rider or citizen, it is just as essential, particularly on account of its effect in keeping car equipment in good or bad condition. Too little attention to track maintenance and repair cannot be branded as other than a fallacious policy.

Cost Records Should Guide as Well as Check

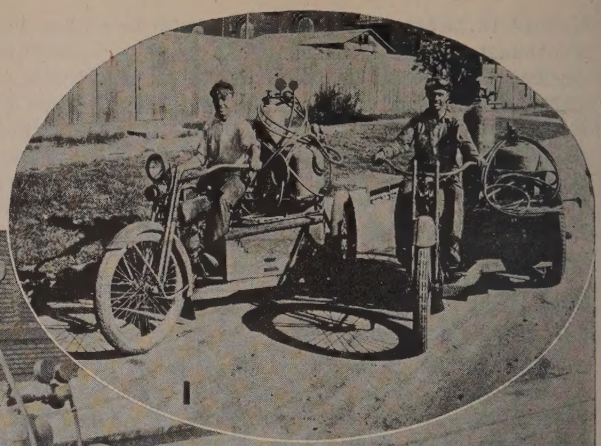
MAINTENANCE cost records have a twofold purpose to accomplish. The first of these has been generally recognized. They afford the management an indispensable means of checking the performance of various departments. At the same time they act as a powerful incentive to the elimination of waste and inefficiency.

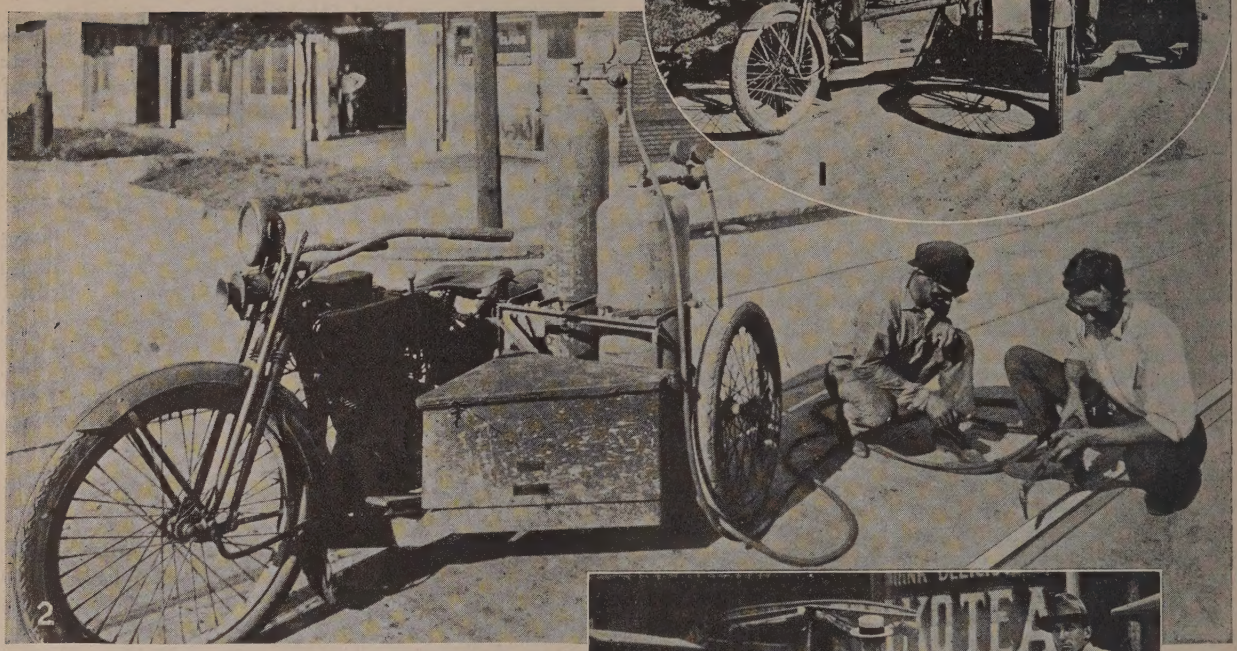
There is, however, an even more important object in the compilation of maintenance costs. They may be made to serve not only as a record of what has been done in the past, but as a valuable guide in future operations. When compiled with this object in view, they become an active part of the maintenance executive's equipment.

General accounts must be broken down to show a comparison for various classes of physical property. In this way only can guesswork be eliminated from the selection of equipment or the determination of types of construction to be used. The character of information which is needed in each department should be the primary objective in laying out accounting subdivisions. Unless each division gives information which is of direct value in determining future action, the expense and complication in records are not justified.

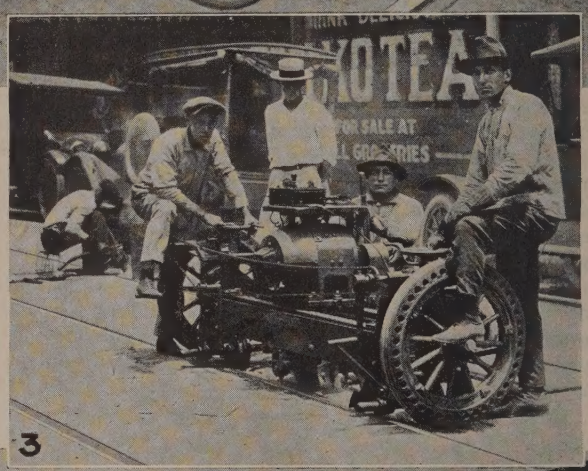
In no department is this more important than in the case of shops and equipment. Lack of proper records is responsible for the tendency to overhaul and repair long after the economical life of equipment has been exceeded. A comparison of the costs on each group of cars would quickly show the fallacy in this practice. The cost of maintaining various types of motors, trucks and air compressors also serves as a valuable guide in determining replacement programs. At the same time such records give the maintenance man accurate information for comparing the performance of apparatus offered by various manufacturers. On this basis cost accounting becomes an active guide in the operation of a property.

New Orleans Is an Extensive User of Labor-Saving Equipment in Track Construction and Maintenance





1. Motorcycle acetylene cutting outfit.
2. At work with the acetylene torch.
3. Atlas track grinder.
4. This Differential side dumping train has a capacity of 40 cu.yd.



Gang Working on Track in Neutral Ground, New Orleans

New Orleans an Extensive User of Track Machinery

Much of This Equipment Is Mounted on Storage Battery Trucks — The Company Has Done a Great Deal in Developing Methods for Track Rehabilitation by Electric Welding—Special Treatment Has Been Necessitated by Unusual Soil and Ground Water Conditions Existing in the City

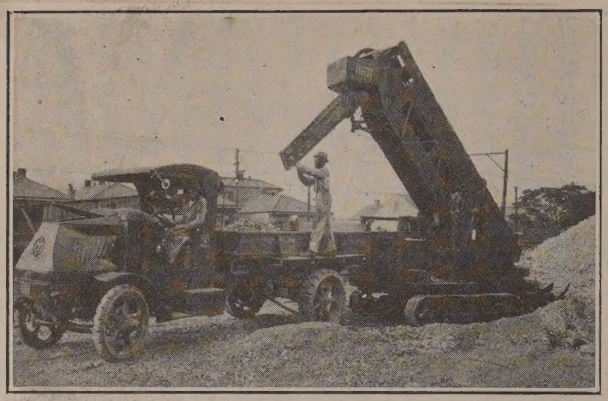
ESPECIAL attention has always been given to track construction and maintenance in New Orleans because of the soil conditions. The level of the greater part of the city is below that of the Mississippi River, which is kept from overflowing its banks by levees. In consequence the soil is always moist.

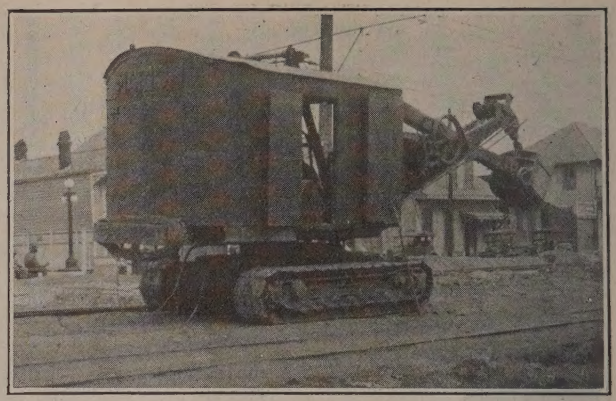
Prior to the installation of subsurface drainage in the city, it was necessary, on account of this moist condition and weak bearing power of the soil, to support the track structure on 1-in. x 12-in. pecky cypress planking. The ballast consisted of either cinders, gravel or shell, the latter predominating. Since the drainage system has lowered the water table several feet, it has been found that a considerable amount of churning takes place beneath the planks whenever water enters the roadbed, and this churning develops void spaces beneath the planks. Consequently, where this occurs, there is a tendency of the track to settle irregularly and require considerable maintenance to keep it in surface. Wherever it has been necessary to rebuild tracks on unpaved streets, the policy of the company has been to remove the entire track structure, including the planking, rolling the subgrade and constructing a new track on 8 in. of slag ballast, using creosoted ties and 7-in. L-491 grooved rail.

In Several Steam Railroad Crossings Recently Laid the Rails Are Seam-Welded to a Base Plate. The Angle Plates Are Also Seam-Welded

In paved street the former method of constructing the tracks was to embed the ties in concrete to a point 1 in. below the top of the tie and then lay a second slab thereon as a paving base. This method provided for the removal of only the top slab when replacement of rails became necessary. This type of construction has been abandoned because it was found that the ties became cut at the rail seat, resulting in a "working" track. The practice now is to pour a monolithic slab, entirely embedding the ties and a part of the 7-in. rail in the concrete.

On neutral ground, of which there is a great deal





At Left, Haiss Loader Loading Slag Into Truck. At Right, Marion Electric Shovel Mounted on a Caterpillar Truck. When Transported Long Distances It Is Put on a 30-Ton Trail Truck

in New Orleans, the track structure consists of 8 in. of slag ballast, creosoted wood ties and tee rails. Owing to the comparatively weak soil, the ballast is supported on a concrete slab at all of the paved intersections. It is also the policy to fasten a guard rail to the tee rail at the intersections to act as a paving guard.

All Special Trackwork Flange Bearing

All new special work that has been installed recently is of the flange-bearing type. It is believed that this type of special work will reduce maintenance and equipment costs as well as reduce noises resulting from the cars pounding over non-flange-bearing special work.

Most of the old crossings have been made flange bearing by electric welding. The general practice was to build the groove up with successive layers of carbon steel and then to top the carbon steel with manganese steel properly quenched. Lately a chrome steel rod has been used for this purpose, as it has been found more ductile and able to withstand wear better. After being welded the groove is ground smooth with a rotary grinder.

The company maintains a metallurgical laboratory devoted largely to the study of welding problems. It is to the credit of the laboratory work that successful methods of welding have been applied to trackwork. Both hard center and solid manganese special work have been successfully welded and repaired. A large amount of hard center work has been reclaimed by welding base plates to broken castings and by building up the worn centers.

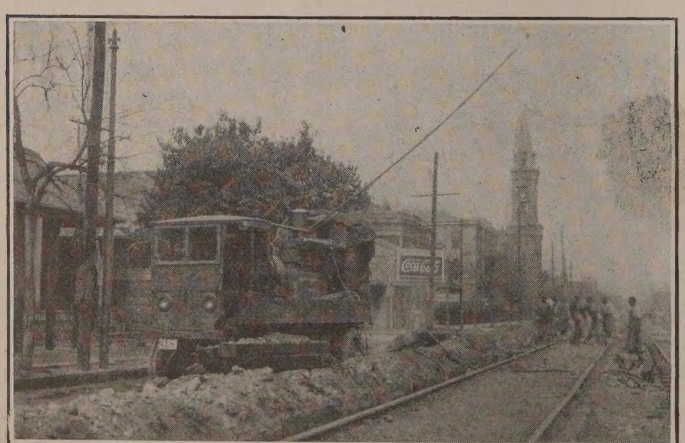
Several steam line crossings have been built by the company recently. These crossings differ from the usual bolted crossing in that the fillers are welded to the rails and all the rails are welded to a base plate. The angle plates are also welded. Several of these crossings have been installed and are giving very satisfactory service.

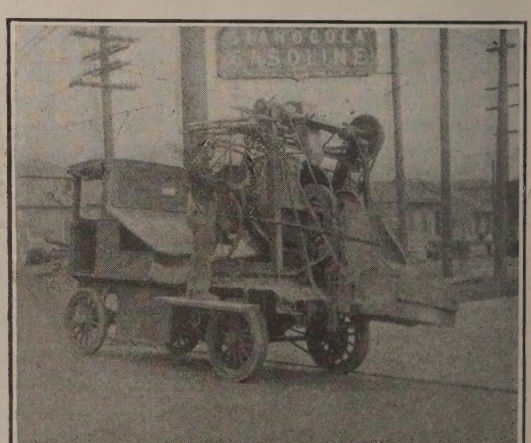
Electric Welding Equipment

Besides its application to special trackwork rehabilitation, electric welding is used extensively in New Orleans for seam-welding rail joints, seam-welding base plates to the rails, etc., in addition to its uses in the track and car equipment shops. Hence, the company has an extensive track welding, cutting and grinding outfit, including:

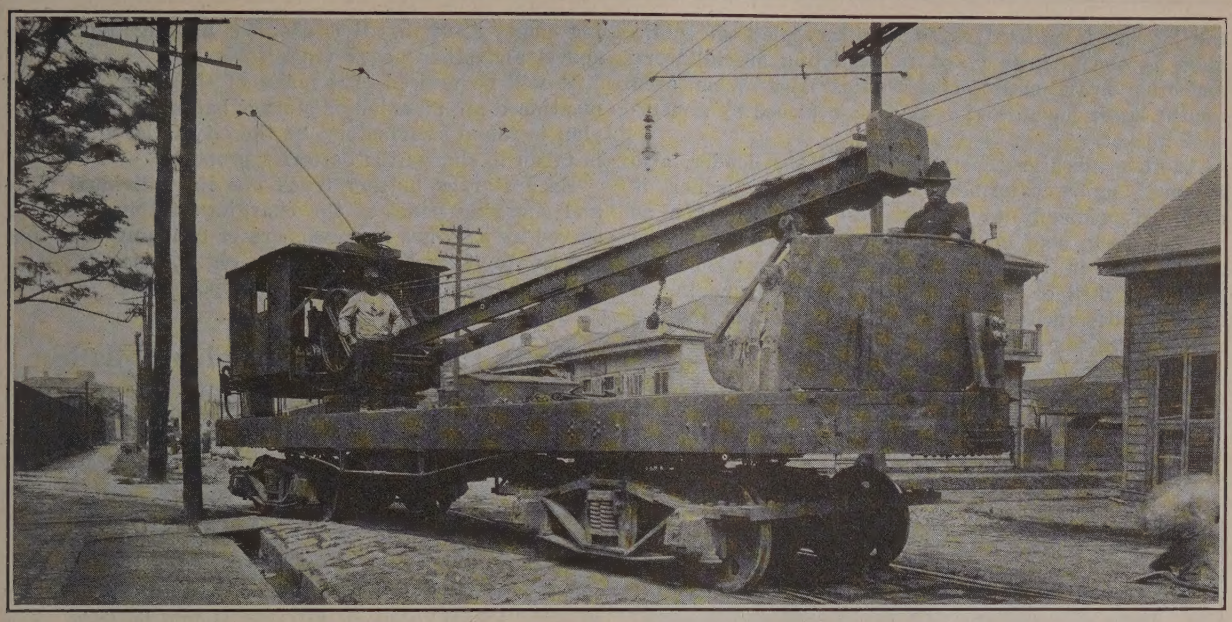
Eight type WW RWB dynamotors.
One type B RWB dynamotor.
One G. E. motor-generator set.
One Wilson O-B bonding dynamotor.
Three oxyacetylene cutting outfits.
Two Universal rotary grinders.
One reciprocating grinder.
One small portable electric hand grinder.
One large self-propelled Goldschmidt grinder.

Further particulars of this and the other equipment described in this article and their uses were given in a paper by E. S. Myers, superintendent of roadway New Orleans Public Service, Inc., presented at the 1925 annual meeting of the Southwestern Public Service Association and published in the ELECTRIC RAILWAY JOURNAL for May 16, 1925. It is sufficient here to say that four of the type WW RWB dynamotors are each mounted on a Graham Brothers truck, one on an electric





At Left, Portable Air Compressors Mounted on Storage Battery Trucks. At Right, Concrete Mixer on Storage Battery Truck



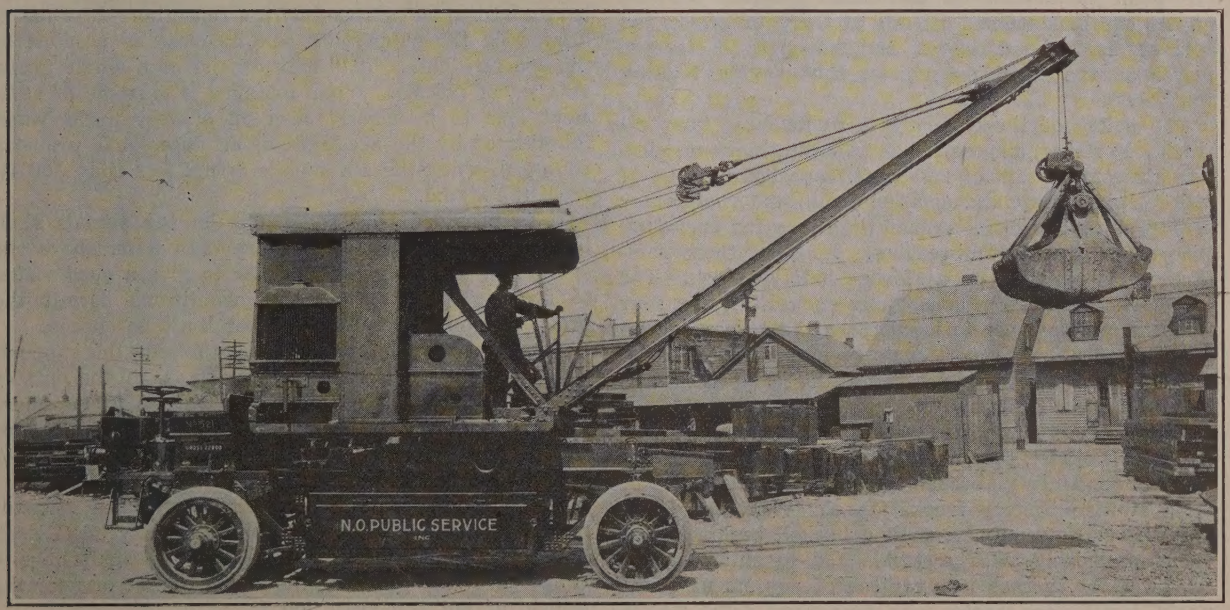
Brownhoist with Boom Down. This Hoist Is Permanently Mounted on the Flat Car Shown

and three of them on 1-ton Ford trucks. Each truck has a specially designed body to carry the welding machine and all the supplies and equipment. The O-B Wilson bonding machine is also used as an emergency welding outfit. The G. E. motor-generator set, the type B RWB dynamotor, the three cutting outfits, the small portable electric hand grinder and the Goldschmidt grinder are part of the welding shop outfit.

Views are shown of one of the three oxyacetylene motorcycle outfits for general cutting. The tanks are mounted on a specially designed side car, which in turn is welded to the motorcycle, comprising a compact outfit. These machines are equipped with 100 ft. of hose, each torch having a complete set of cutting and burning tips so that it can cut rails and bolts and burn holes as desired.

Besides the small equipment shown on page 664, the company has a large number of heavy track machines. Most of these are illustrated in the accompanying views. One shows a Differential dump train consisting of a motor car and trailer. The company had four of these trains, each train having a capacity of 40 cu.yd. Three of these trains are side dumping and the fourth is center dumping. In the paper by Mr. Myers at the 1925 Southwestern convention, already mentioned, the estimate was given that these trains saved the company in handling material in 1924 more than $19,000 over the cost with the usual flat car train. This cost was based on a charge for labor for unloading the flat car of 30 cents per hour, certainly a conservative figure for other cities.

A Marion electric shovel, mounted on a caterpillar tractor, is used for excavating. This machine operates for an average of 3 cents per cubic yard. The machine weighs 60,000 lb. and is transported about the city on a 30-ton Freuhauf trail truck. When not excavating



Universal Crane with Bucket Attached. This Crane Is Also Used Extensively in Handling Special Work

the Marion is utilized as an auxiliary piece of equipment in the material yard for handling special work and other heavy material, as well as slag. When used for the latter purpose, the shovel is replaced by a clam-shell bucket.

Another machine illustrated is a Haiss loader, also mounted on a caterpillar tractor. This loader is designed primarily to handle loose material such as crushed rock, slag or gravel. It has been used very successfully in track reconstruction work where the ballast is shell or dry loose dirt. When trenching, a specially designed Barber-Green conveyor is hitched to the Haiss for the purpose of depositing the material on the the side of the trench, or in the case where double track exists for loading directly on to Differential work trains. The Haiss cuts a trench 9 ft. wide.

The track department also has five portable concrete mixers. One mounted on a storage battery truck is

The Number of Storage Battery Service Trucks Has Been Increased so Greatly that a Charging Shed Is Now Being Built for Them

illustrated. The four others are on caterpillar tractors. Like the Marion shovel, they can be taken from one point to another on the trailer. These concrete mixers can be stationed directly at the point where the concrete is to be deposited and moved by their own power as the work progresses, thus saving hauling charges.

The policy of the company is to machine tamp all track. For this purpose it has two Westinghouse electric air compressors of 250 cu.ft. capacity and one of 110 cu.ft. capacity and one Ingersoll-Rand compressor of 110 cu.ft. capacity. All of these are for operating tampers and concrete breakers. Each of these compressors is mounted on a storage battery truck. The 110-cu.ft. compressors can supply enough air for four tampers or two concrete breakers, and the larger compressors for a proportionately larger number of machines. Power for operating the compressors is taken from the trolley wire.

Other track equipment found useful includes one large Brownhoist, permanently mounted on a motor flat car, and one Universal crane of 2½ ton capacity mounted on a storage battery truck. In the view this latter crane is shown equipped with a bucket, but it is also used extensively with a tackle for handling special trackwork. Another heavy piece of equipment found useful is a Walter tractor with four-wheel drive, weighing empty 8,800 lb. It is used for hauling the Marion shovel and other heavy track tools.

It will be noticed that many of the track machines mentioned are mounted on storage battery trucks. This plan is found satisfactory, as the city is level and care is taken to charge the batteries properly.

Each storage battery truck has its individual place and charging panel at the charging station, which is served by a 75-kw. motor-generator charging set. The trucks are generally charged at night. A view is shown of the charging station being equipped.

Rules for Crossing Signal Installation in New York

RULES and regulations to govern future installation of horizontal flashing light signals at railroad grade crossings in New York State have recently been issued by the Public Service Commission. Some time ago the commission fixed the flashing signal as the standard grade crossing warning for this state, decreeing that whenever any new signal was installed or any existing signal changed this type should be used. The order fixing the signal as standard left for the future the determining of the regulations for the use of these signals.

It is provided that the lights may be installed either in the center of the highway or to the right thereof as one approaches the railroad. One signal must be placed on each side of the crossing. Where the signal is installed in the center of the highway the pole supporting the signal must be embedded in a block of concrete not less than 2 ft. high and 5 ft. wide at the widest point. In the case of installation in the center of the highway the concrete base must be painted in checkerboard fashion, with black and white. The roadway must be increased so that there shall be a clear width outside the concrete block on each side of not less than 12 ft. The widening of the roadway shall be diminished gradually away from the railroad so that the normal width of the pavement shall be reached at a point not less than 75 ft. from the signal.

Each signal installed in the center of the highway is required to be equipped with a reflecting white prism located on the supporting pole as close as possible to the concrete base. This may consist of a single prism or a set of prisms. When installed it must be of sufficient size to be clearly seen on a clear night when illuminated by the headlight of an automobile properly equipped, when the automobile is not less than 300 ft. from the signal.

It is provided that the lamps on the signals shall be not less than 6 ft. nor more than 9 ft. above the surface of the highway, in order to give a good vision to a driver. Where physical conditions permit the order recommends that the lower limit be chosen.

When the signals are placed at the side the supporting poles must be located within 15 ft. of the outside rails of the tracks, and not nearer than 6 ft. nor more than 10 ft. from the nearest edge of the pavement of the highway, unless local conditions, such as in city streets, require a different location.

It is provided that all lamps shall be hooded, so as to render them as visible as possible in the daytime. Each lamp when operated at normal voltage shall have a range on a clear day, with a bright sun at or near the zenith, of not less than 300 ft.

What Type Cars Does the Public Want?

Mechanical Details Have Been Influenced Too Much by Cost, Weight, Paint and Precedent—Merchandising of Rides Requires Speed, Comfort and Pleasing Appearance

By H. S. Williams
Assistant Superintendent of Equipment
Department of Street Railways, Detroit, Mich.

ONLY a short while ago a paper was read before the Society of Automotive Engineers that carried an important message for electric railway equipment men. It was the story of the design and building of a bus, and thus an engineering problem. An engineer directed the work, but the noteworthy feature of it was that he made his engineering subservient to the greater idea of, "What does the public want?" Observers were sent throughout the country to study public needs, and an analysis of their reports formed the basis of the design. The engineering details then followed this outline. The logic of this method of procedure is too apparent to require elaboration and can well be imitated by electric railway men. In the past too much consideration has been given by those charged with car construction to purely mechanical details—and these details have been influenced too greatly by the factors of cost, weight, kind of paint, precedent, etc., whereas they should have determined first what elements would help merchandise the service and then fit the details about those elements. The most important thing for the engineer to know is what the public desires and is willing to pay for.

Perhaps it is not entirely the fault of the equipment men that they have not always met this requirement. It is possible that the managements have not given them the leeway required, for the average equipment man is of the retiring, modest type and is not sufficiently self-assertive. Be this as it may, the equipment man should be able to look at car design, construction and maintenance from the broadest possible viewpoint and build his plans first on service, comfort, appearance and quiet operation. In support of this view the following is quoted from a recent address of President W. J. Harvie of the New York Electric Railway Association: "Present-day conditions make it necessary for us to take stock of ourselves and our industry and, having in mind the fundamental needs, adapt our equipment and methods to present-day ideas of good service."

Speed, Comfort and Appearance Essential

What, then, are the elements on which the mechanical men must depend to do their share of merchandising? In the order of their importance, these consist of speed, comfort and appearance. It is well-nigh universally conceded that speed is the most important feature in passenger transportation, assuming, of course, that no undue risks are run and no unusual discomforts are imposed. It might be argued that this would not apply in localities where there is no competition, but today "there ain't no sech animal." The private auto competes everywhere. What is the one feature that has allowed the jitney to live? Speed. Being small units, carrying not more than six passengers, they make very few stops and so can make a much higher schedule speed than the trolleys. An experience is recalled of one trolley line operating in competition with a bus service where the street car suffered loss of traffic which was traced to the better speed of the bus. The car line was thereupon placed on a faster schedule than the bus, with the almost immediate result of regaining its lost riders.

Better Acceleration and Braking Needed

To achieve the desired speed in car operation more must be done than to provide sufficient capacity in motors and proper gear ratios. Acceleration is of utmost importance, especially in city transportation, where stops are frequent and limit the ability to make speed. The acceleration should be at the highest rate consistent with comfort, but it must be steady and free from jerks or changes in rate. Moreover, the free running speed should be attained as quickly as possible.

Operation of brakes is a corollary to acceleration and the same general reasoning is applicable. The rate of retardation should be as great as possible. On practically all cars this rate is limited by the possibility of skidding car wheels. It is possible, however, to add magnetic brakes to the air brakes and decrease the time of making the stop by approximately 25 per cent. This may at first seem radical and the objection may be visualized of passenger discomfort, but this has been proved not valid if the end of the stop is eased to prevent the jerk.

It is well at this point to call attention to the necessity of perfecting all the mechanism involved in the stopping of a car to such an extent as to eliminate what, for lack of a better term, may be called backlash. This may involve not only the brake rigging but truck bolster play, tilting of truck springs, etc.

While primarily the items outlined above affecting car speed are the problems of the equipment men, their duty ends with the selection of the proper apparatus and giving correct instruction as to its use; the finishing of the job—and it is by no means the easier or less important part—falls upon the operating officials. For if the mechanism is not handled as it should be, if passengers are thrown from their feet in starting and their necks cracked in stopping, all the advantage of added speed is turned to serious disadvantage.

Passing to the question of comfort and convenience, a large field is open for discussion and few reliable data are available. Here personal judgment must govern largely and the various available schemes weighed with their relation to the property under consideration. It is safe to assume that agreement may be had on the general proposition that the more comfortable the car

the greater will be the number of riders attracted to it. Let us then determine the various factors which go to make up this feature and look into their possibilities. Without attempting to arrange them in order of importance these factors include quietness, easy riding seats, good heating and ventilating, smooth-riding qualities, low steps and adequate destination signs.

During the past two years the value of quiet car operation has occupied a prominent position in the minds of railway executives. It is admittedly desirable to eliminate noise, not only on account of its effect on the car riders, but also because of its annoyance to residents adjacent to car lines. In this age of rubberized transportation, automobiles have taught people the possibilities of quiet operation. Anything that outrages their sense of hearing is bound to meet with opposition, and opposition of that character will never help merchandise car rides. There is a deep-seated idea in the popular mind that electric street cars are obsolete. The psychology of this is not hard to understand. It is merely that a new style has arrived and new styles are always popular, whether practical or not. That

As a Means of Visualizing a Proposed Design a Model in Clay Such as This Is Helpful

makes it all the more difficult to sell the older idea, imposing upon those in authority a task worthy of all their skill. Can the railway manager allow noisy cars to operate and expect people, for the privilege of riding in them, to give up their private autos? No, indeed! Quiet cars are possible and in the next few years they will have to be produced. As compared with an automobile the street car is under a severe initial handicap with respect to noise by having to run on steel wheels instead of rubber. Even so, are the automobile manufacturers satisfied with the quiet operation of their cars? They are not, and they are spending immense sums on research work which will point the way to still quieter running. If they, being past-masters in the art of selling, are so determined to eliminate noise, why should not we in the railway transportation field take the cue from them and do our utmost to decrease our sales resistance by noise reduction? But this decision must come from the management. When it does the mechanical men can be relied upon to do their part.

When we have quieted all the disturbing car noises and satisfied the passenger on that score, let us look into the question of car seats. There are many angles to this question, not all of them figurative. The more comfortable the car seat, the more desirable becomes the ride in it. But just what constitutes a comfortable seat is not so easily determined. For instance, a soft plush seat may be comfortable in the winter, but with the thermometer ranging around 100 deg. the plush seat, particularly if it be colored red, is not inviting. A well-known instance is recalled where a vote of passengers indicated an overwhelming preference for the hard slat seat. So locality has its influence. Just what type is preferred can be determined only by a careful survey of local conditions. It is safe to say, however, that a well-upholstered, springy cushion and back will prove very popular in most localities, and thus will attract additional patronage.

Seat height has apparently received but little consideration. It is the only dimension on a street car that has ever attained the dignity of becoming a fixed standard, and at that it is wrong if comfort is wanted. A large share of the passengers ride with feet dangling, or just able to maintain toe contact with the floor. This is manifestly uncomfortable. It is believed that a much more satisfactory condition would obtain if seat height were reduced to 17 in.

Then there is the question of the shape of seats. Certainly an otherwise perfectly good seat may be ruined by improper shape and slope to cushion and back. Conversely, a hard seat may be vastly improved if given proper form and if pitched correctly. Also seat width is important. An unsupported overhang of the end man, especially if the ride be long, never wins a friend for the road. The matter of foot rests and arm rests as seat auxiliaries is important. These details should be provided for long rides if possible, as they surely are conducive to comfort. Sufficient knee room is important. Attempts have been made to increase seating capacity by crowding seats more closely together, but to do so is to sacrifice comfort and cannot be recommended. The amount allowed in the standard city car dimensions of the A.E.R.E.A. is 29½ in. per seat. Nothing less than this should be tolerated. With the better upholstered seat backs and greater slant to them which is appearing in recent designs even greater space must be provided.

Attention is called to the devices that have been developed by bus builders to give added comfort to seats. They have used rubber in many places in such a manner as to permit a certain amount of movement to the seat, the idea being to cushion the jerk produced by a quick start or a sudden stop.

Merchandising of rides will be made easier if cars are properly heated and ventilated. Means of supplying adequate heat are at hand and mechanical men can readily take care of this phase of the situation. But to give satisfactory ventilation. "Aye, there's the rub."

In the first place there is no accepted standard of ventilation for cars. A standard could be established that might be satisfactory to a majority of engineers and boards of health, but it would inevitably fail to satisfy all car riders. They do not understand ventilation and are guided almost entirely by their sensibilities. Their views and feelings are too divergent to accept any standard. However, a great deal can be accomplished along the line of ventilation. Exhaust ventilators are in almost universal use. Perhaps one of the most serious defects in the majority of cars is absence of proper air inlets. It is believed that the ideal system of ventilation would provide an intake and exhaust for each seat space and under the control of the passenger. This would at least place the ventilating means in the hands of the passengers, and in a way put the ventilation up to them. A scheme similar to this has been placed in operation in two big cities and has produced very satisfactory results.

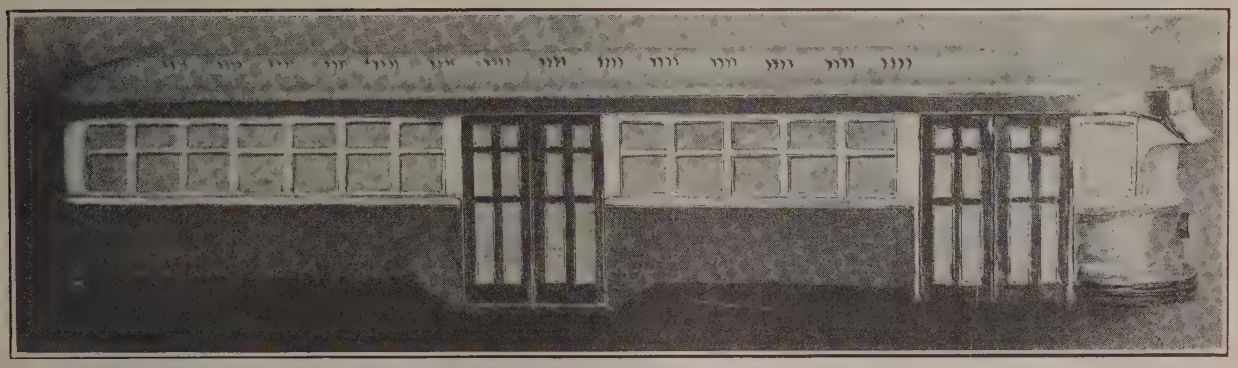
Smooth riding qualities of cars provide another fertile field for the mechanical men to cultivate. But there is need for much research work before this part of the problem can be conquered. The first step should be the development of adequate recording instruments, perhaps of the seismographic type, which will trace on paper the various components of car motion so that the personal equation will be eliminated. Following this the mechanical details can be tried out and their values readily determined. Lubrication of car springs has been tried and the report indicates improved riding characteristics.

Car signs are very important for the convenience of passengers. There are three principal elements which should be considered aside from mechanical details: First, the signs should tell the story of the car's route and destination as completely as possible; second, they should be of high visibility and, finally, they should be simple and easy of interpretation. Signs with multiple rolls giving a wide range of information have been used with great success. As to visibility, the requirements are plain lettering of as large size as practicable, sufficient illumination for night service and locations as high on the car as possible. It is believed that route numbers are essential to make the system simple. To the stranger in the city, nothing is easier than to get his car riding instructions by numbers.

In this connection, also, it is well to remember that the stranger in town, and often the resident, is at a loss to know which end of the car to enter. Many cities have front, center and rear entrance cars, so the traveler is sorely perplexed unless there is some designation on the front of the car giving him the needed direction. Removal of the petty annoyances to the passenger is always good business and in this case the cost is trifling.

The subject of floor covering is receiving much attention. The old wooden floor with slat aisles is being looked upon with disfavor where more modern and luxurious cars are desired. Surely a linoleum, rubber tile or similar floor cover makes for greater attractiveness and cleanliness and undoubtedly possesses a definite sales value.

We come now to the question of appearance of cars, for beyond a doubt this has a merchandising value too. It is a parallel case with the comparative sales value of a clean, up-to-date meat market and a dingy one. No one can question that the first will draw the bulk of the trade and get away with better prices. So it is with the street car. People want the best and are willing to pay for it. A great deal of thought and money have been spent to improve the appearance of cars, the Grand Rapids case being an outstanding example. It is believed that an improved and modernized design of car will do a great deal to convince the potential passenger that he can secure a sufficiently luxurious, safe, speedy and cheap ride to induce him to leave his auto at home. Perhaps a design imitating the automobile will prove popular. With double-end cars this becomes very difficult, but with the single-end car the solution is easier.



The Effect of Substituting Small Ventilators for Large Is Seen by Comparing This Clay Model with the One Shown Opposite

With this idea in mind, the writer is suggesting a slight change in present practice to meet the demand for a car of more pleasing appearance. To show this as clearly as possible a small clay model of the proposed design has been prepared. A reproduction of it appears herewith. The underlying idea in this design is to give to the trolley car the long, low, rakish lines so popular in automobile design. The front platform is drawn in or tapered and the roof is also tapered from the body proper. All this is to give the so-called "streamline" effect. It is to be noted that the rain deflector or gutter above the front doors pitches toward the front to help produce this same effect. Many cars have this line pitched the opposite way, but this is out of harmony with good appearance. The large multiple sign is similar to that used on the latest type of Detroit cars. This sign is not suggested in this design on account of beauty, but strictly for utilitarian purposes. The most radical element of the design is the visor over the motorman's window. This feature was added solely to improve the appearance of the car, though it has a distinctly practical use. Not long ago visors were prac-

tically unknown on automobiles, but they have proved so useful that they are now used on most cars. In fact, on the latest models of sedans, the roofs are extended to form a visor and the beauty of the cars' lines are much enhanced.

The argument might be advanced that a visor as illustrated would not do, as it would require the motorman to remain seated at all times, whereas rules on certain roads require him to stand up at specified places. The answer to that is that the rule referred to is a relic of horse car and hand brake days and cannot be justified today. We might just as well make a man stand up when he is driving his automobile across a busy street intersection.

One feature of arch-roof design that has always been an eyesore is the ungainly appearance of the ventilators. The writer has the suggestion to offer that the number of ventilators be increased but the size relatively decreased, so that they may be less conspicuous. It might even be advisable to go to a composite form roof to permit a more satisfactory arrangement. The clay model was revised to show just what is intended and is reproduced herewith.

Would not a new car design on the order of these suggestions be worth while? And would it not give a newness and up-to-date appearance to our cars which would remove some of the stigma attached to the present types and give them added sales value more than sufficient to justify the trifling extra cost? All of the points raised are capable of solution if the proper incentive be given. Wishing alone will not do it, but wanting to make progress with sufficient zeal to devote to it the necessary effort and capital will bring forth every improvement.

Some Novelties in Overhead Work in Atlanta

The Georgia Railway & Power Company Has Developed Some Overhead Line Equipment Which Greatly Quickens the Work of Erection and Maintenance of the Overhead System — Other Practices Mentioned

BEING part of a very large electric railway and power system, the electric railway department of the Georgia Railway & Power Company at Atlanta, Ga., has been able to utilize to a very large extent the experience of the power branch of the company in its engineering methods. This exchange of methods is particularly close in the distribution department. It is not surprising, then, to find that the railway overhead department in Atlanta has developed a number of methods and types of machines for doing quickly a great deal of work which, by older methods, would take a much longer time.

Setting Poles

One of the most useful of these machines is one for digging holes for poles. The standard pole of the company is a creosoted long-leaf yellow pine pole, grown in Georgia. This type of pole has been used exclusively by the company for the past three years and is estimated to have a life of about 20 years. Poles of this kind can be bought treated for about $11. They are set in earth without concrete, except in the case of a dead-end pole, and require a hole about 6 ft. deep and 24 in. wide. These holes are dug by a Western Electric pole-hole digger of the kind shown in the accompanying illustrations.

When used in ordinary dirt, this machine can dig a hole 6 ft. deep and 2 ft. in diameter in about 3 minutes. The operator lets the bit down until it has penetrated to a depth of about 2 ft. By this time the bit is clogged with dirt, and when it is withdrawn the dirt will be found to be sticking to it in a compact mass. The bit is then freed by being revolved rapidly above the hole and the dirt is thrown off by centrifugal force. The bit is then dropped into the hole again and the process is repeated once or twice until the hole is ready. The digger is known as the F. W. D. four-wheel drive type.

The pole is then set by a derrick, which raises the pole at its center of gravity and drops it in place. The digging machine shown can also be used for setting poles and under favorable conditions can dig the hole and set a pole all in seven minutes. As a rule a separate derrick is used for the setting process because of the demands on the digger for digging work. Only two men are required for this setting operation, the driver of the derrick truck and one other man.

Altogether the Georgia Railway & Power Company has about 41,000 poles within the zone formed by a 7-mile radius from the center of Atlanta. With their creosote protection these poles do not require painting either for preservation or appearance. In fact, the pole lines of the company are noticeably attractive in appearance because of their straightness, regular spacing, uniformity and dark hue.

Stringing Live Trolley Wire by Truck

Another piece of equipment which has been found very useful in Atlanta is the tower truck for stringing trolley wire shown in accompanying illustrations. Except for the truck itself, this piece of equipment was built in the shops of the company for a cost of about $750. It has been in constant use since its completion last summer, with a great reduction in time and labor for both stringing new wire and repairing breaks.

Formerly, for stringing any extended stretch of wire, use was made of three cars. First came a 1½-ton truck, which hauled the reel car. This made two cars, and these two were followed by a tower car carrying the linemen to make the attachments. Besides the force required to man this train, it was objectionable because of the room taken by it on the street. Now all of this work is done by the single tower truck shown.

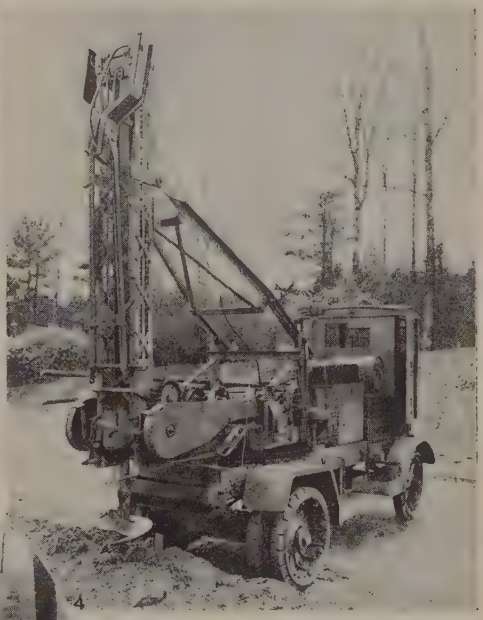
The reel is carried in the center of the truck and the wire is paid out over the 10-in. swiveled sheave, ad-

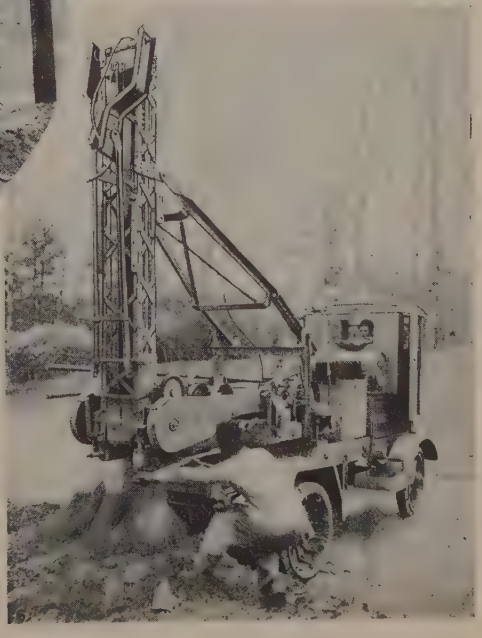
Atlanta Has Been Able to Facilitate Overhead Line Construction and Maintenance Greatly by the Equipment Illustrated on This Page

The tower car shown in illustrations 1 and 2 can string a mile of trolley wire in 30 minutes.

The company's pole digging machine is illustrated in Nos. 3, 4, 5 and 6.

It will dig the hole for a pole in three minutes. This pole hole digger is backed up to the point where the hole is to be dug. The bit is run down about 2 ft., then lifted up and cleared as shown in illustration No. 6, then lowered again and the process continued till the work is done. View No. 3 shows the machine returning from work.





Attractive Overhead Construction at a Carhouse Entrance, Atlanta. All Curves in Atlanta Are "Backboned" in the Same Way as These Curves

justable as to height, shown in the view about 3 ft. above the working platform of the tower. The band brake on the reel is controlled by the driver of the car, who also raises and lowers the tower by motor. The connection between the motor shaft and tower-raising shaft is by sprocket chain, not shown in the illustrations. This sprocket chain is protected by a shield for the sake of safety.

This car requires only a single crew, which can string a reel of trolley wire (about 5,280 ft.) in about 30 minutes. The usual practice is for this car to be followed by a regular tower car, whose crew does the insulation. This takes a longer time, so the crew of the first car, after stringing the reel, returns to help insulate. Altogether it takes about 2½ hours to do both operations of stringing and insulating a reel of trolley wire. Obviously, the tower has to have considerably greater strength than the ordinary tower as it has to take the strain of the wire. As a rule all trolley wire is strung live.

This tower car is also used extensively in repair work, and when so employed it carries a crew of two men. On reaching a break the driver runs up the tower with the lineman on it. About ten minutes is all that is required usually to fix a break.

Features of Overhead Work in Atlanta

There are some features of the overhead work in Atlanta, in addition to the equipment used, which should be mentioned. Most of them are illustrated in the general view of the entrance curves to the Piedmont Avenue carhouse in the accompanying illustration.

All curves are "backboned" by an extra wire, which is a $\frac{5}{16}$ wire, stranded. The result is that no difficulty, practically, is experienced from a curve break. As the pull-offs are placed about every 7 ft., a broken trolley wire on a curve cannot swing very far, and two men on an emergency truck can repair the trouble with a sleeve or new section of wire very quickly, because, with only 7 ft. between pull-offs, the man on the tower can reach both ends of the break without trouble. The short spacing of pull-offs also makes the trolley wire take a very even curve and so reduces wear. No. 000 trolley wire is used.

Another feature of the overhead construction shown is the use of two strain insulators on each side of the trolley wire in all spans. One of these strains is near the trolley wire, the other about 5 ft. from the pole. In consequence, a man working on the trolley wire cannot touch a ground, and in the same way a man who happens to be working on the pole cannot touch a live span wire. In the view shown wooden strains are used near the trolley wire and porcelain strains near the pole, but often porcelain is used in both places.

No Pull-Ins for Five Days at Harrisburg

ON FIVE consecutive days last month the cars of the Harrisburg Railway operated a total of 50,103 miles without a defect serious enough to require a pull-in. The daily record for this period was as follows: March 24, 10,414 miles, 90 cars operated; March 25, 10,386 miles, 89 cars operated; March 26, 10,375 miles, 89 cars operated; March 27, 11,107 miles, 91 cars operated; March 28, 7,911 miles, 49 cars operated.

The Paris Tramway System has recently put in service a single-truck radial axle car which has a length between bumpers of 37 ft., with a wheelbase of 11 ft. 10 in. The car is of the center-entrance type and has a capacity seated and standing of 49 passengers.

Modernizing Dipping and Baking

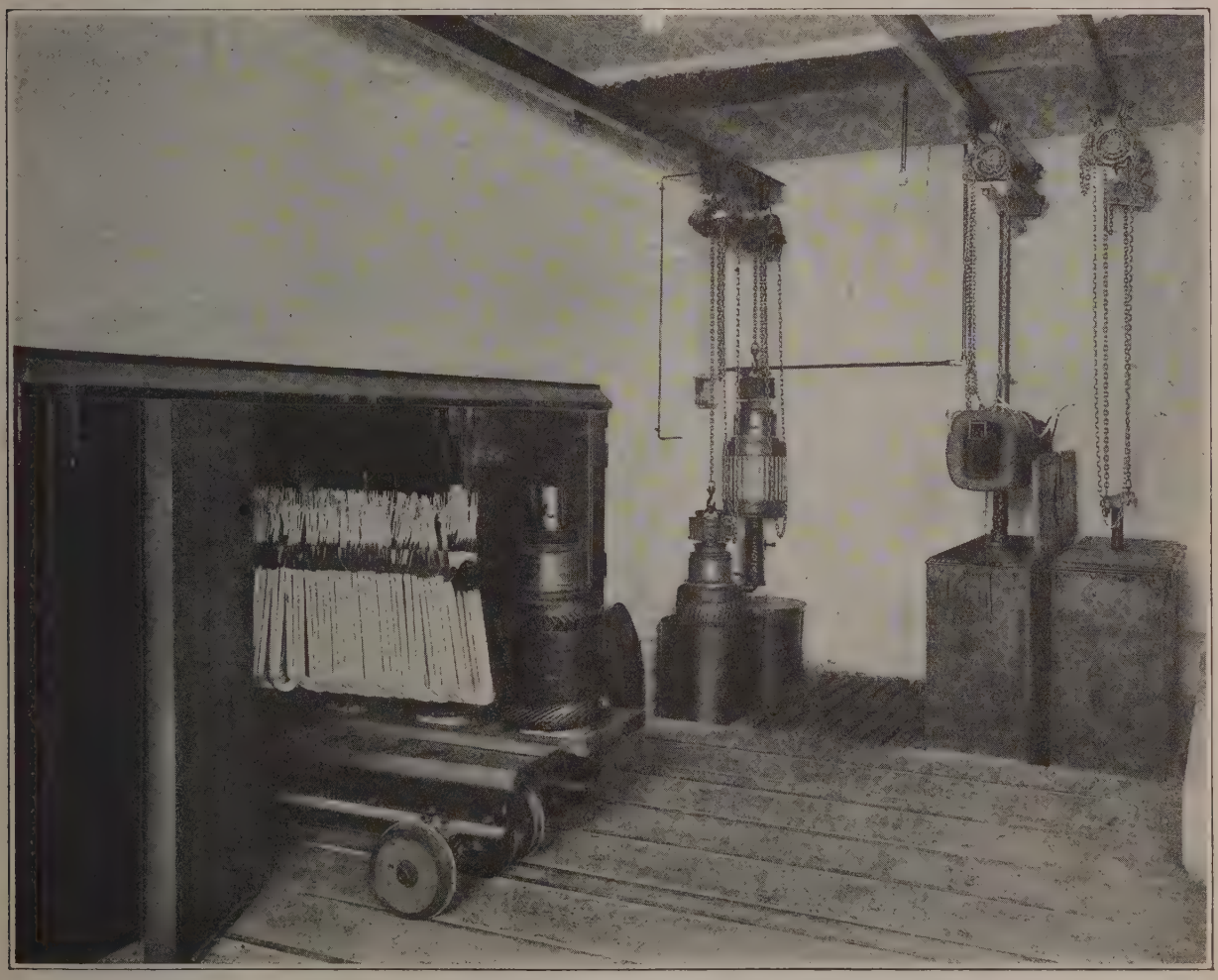
Facilities for Dipping and Baking Electrical Equipment in the Shops of the Montreal Tramways Were Increased in Size and a Number of Improvements Made to Facilitate Handling of Equipment and Reduce Labor

By Julian M. Scott
Assistant Superintendent of Rolling Stock Montreal Tramways, Montreal, Canada

IN ORDER to take care of the increase in work which was necessary to be done in connection with dipping and baking of electrical equipment and to provide for the use of the most modern methods in this work, the Montreal Tramways found it necessary to revise entirely its dipping and baking facilities approximately two years ago. The original oven was 4 ft. 6 in. square and had vertically sliding doors. It was steam heated by pipes on the floor and wall. All material was handled into and out of the oven through the use of small hand trucks.

An extension of the dipping and baking facilities was provided by removing a section of wall which was alongside a passage equipped with fire doors and by extending the adjacent wall until it met the main shop wall. This section was equipped with impregnating tanks, vacuum pumps, dipping tanks and overhead trolleys for handling materials. An oven was provided alongside this section by adding a lean-to along the entire length. Connection between the section used for dipping and the oven is through five pairs of double sheet steel doors. These are insulated with cellular asbestos blocks. Ten tracks are provided into the oven for operating trucks in and out.

The tracks consist of 3-in. channels laid flush with the floor and with a small wheel flange groove. With



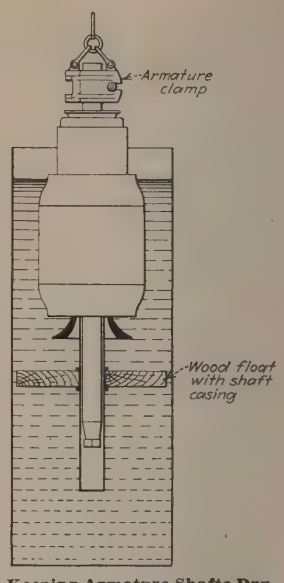
Trucks with Armature Coils and Armatures Are Seen at the Left as They Are Being Rolled into the Oven. The Armature Dipping Tanks with Chain Hoists and Overhead Trolley Are Seen in the Center, and at the Right Are Two Tanks Used for Dipping Field and Armature Coils

A Hinged Steel Clamp with Copper Gripping Strips Is Used to Grip the Ends of Armature Shafts During Lifting

this construction the floor presents a practically unbroken surface which is excellent for working on or for trucking. Accompanying line drawings show the original room and a layout of the facilities now provided.

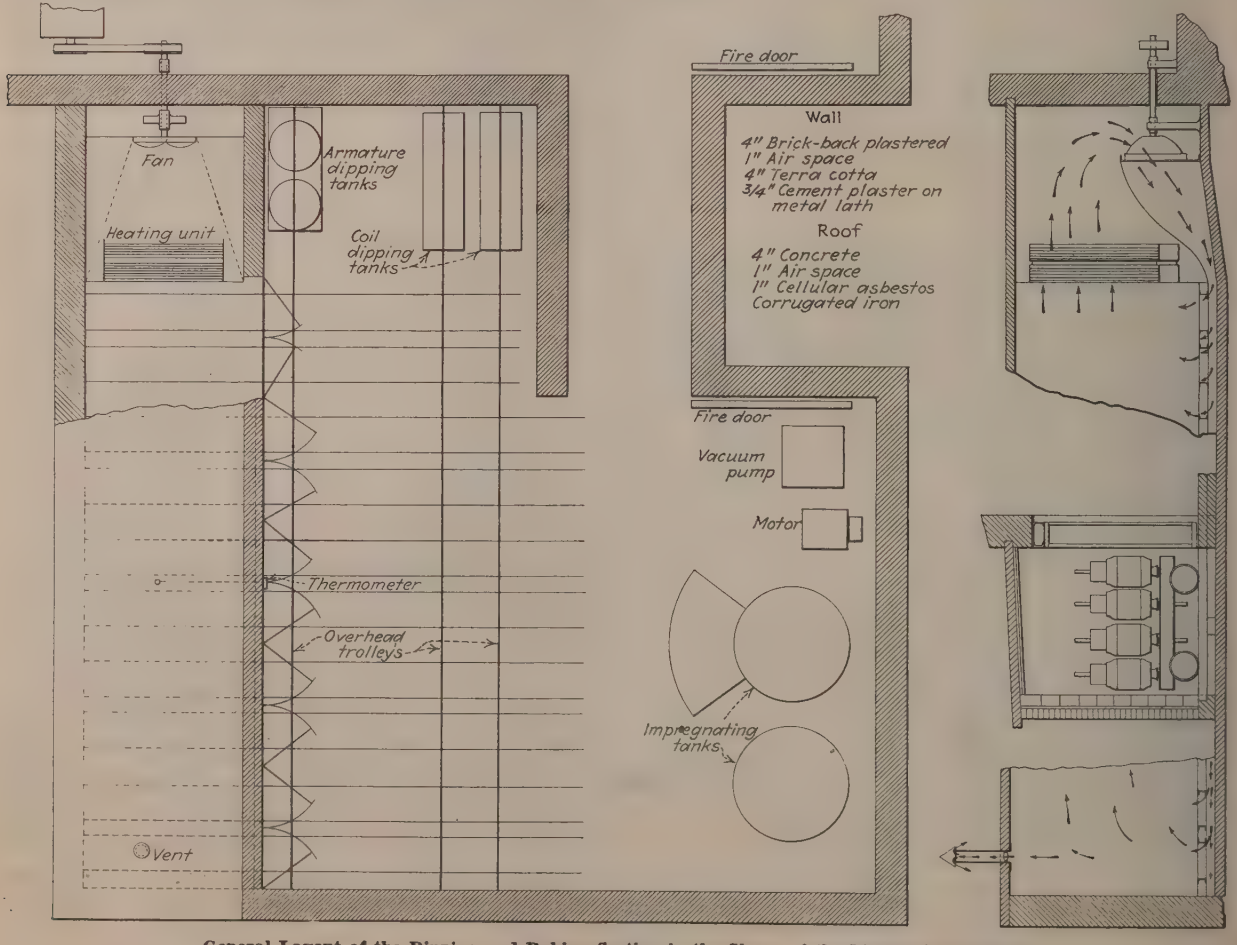
The oven is heated by a single set of vertical steam coils installed at one end. Air is drawn through the steam coils by means of an ordinary ventilating fan set in a steel partition, and the air is then discharged into the duct formed by the bottom of the oven and the tracks. A temperature of 240 deg. F. is easily maintained and a dial type thermometer is provided on the outside to indicate temperature. All spaces between the rails are filled in with loosely fitting steel plates. This permits a gradual passage of heated air from the ducts through the length of the oven and maintains a very even temperature in all parts.

The trucks now used are of a new type and are all alike. Each remains on its own track. The truck body consists of two 6-in. channels bolted together. These are placed back to back and an oak platform ¾ in. thick is installed over this. This platform consists of five blocks and space is provided between each pair, just sufficient to accommodate the ends of armature shafts. With this arrangement four armatures can be installed on a truck for baking. The center block has a hole provided to receive a pin for a pivoting rack which is used to hold armature and field coils. Drippings from the coils or armatures are caught in removable iron pans. These extend over the entire truck platform and have either one or four holes as required for either armature or coil baking.

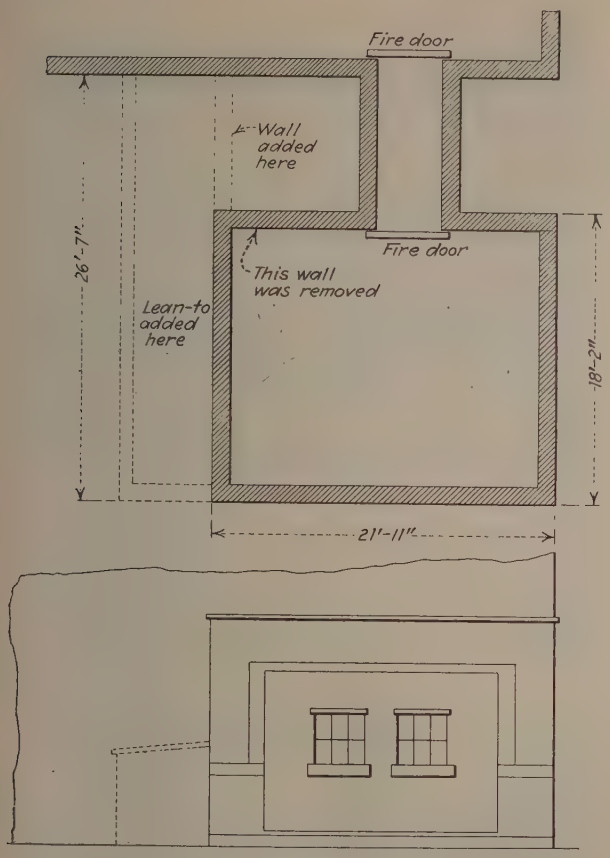


Keeping Armature Shafts Dry

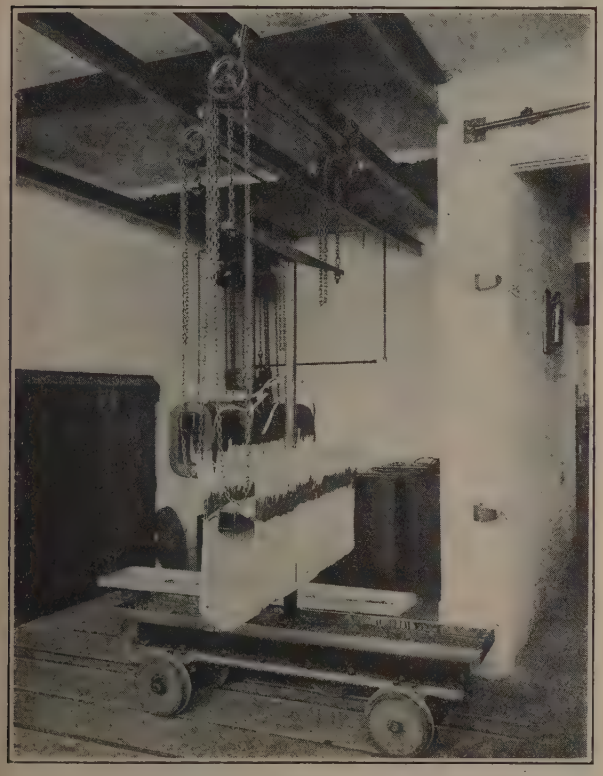
Armature shafts are kept free from the varnish during dipping by having a float with a pipe center to receive the armature shaft.



General Layout of the Dipping and Baking Section in the Shops of the Montreal Tramways



Original Section of the Shop Before Changes Were Made to Install Dipping and Baking Equipment. Full Lines Show the Walls as They Were Originally and the Dotted Lines Show the New Construction



Racks with Coils in Place Are Handled by Twin Chain Hoists and Are Readily Placed in Position on the Truck by One Man

The racks for supporting field and armature coils during baking have a central upright member made of iron pipe. The bottom part of this fits over the pivot pin in the truck and the upper end is fitted with a bar for lifting. Lifting is done by two chain hoists, which attach to the end of the lifting bar. The racks are made with either a single or two crossbars. The single racks are used for armature coils and the two-bar racks for field coils. These crossbars pass either through or on each side of the vertical iron pipe, as shown in an accompanying illustration. Ninety armature coils or ten field coils can be handled by a single rack.

The entire operation of dipping and draining coils is carried out in a completely closed tank. A rack loaded with coils is placed over the tank by the twin chain hoists and is lowered into the varnish to the correct depth. The cover of the tank has a slot in it to allow the stem of the rack to pass through. The cover can thus be closed and the outer ends of the slot sealed with small hinge plates, thus completely closing the tank.

For draining, the coil rack is raised until the coils occupy the space between the varnish and the cover. They are allowed to remain in this position with the cover closed until the draining operation is completed. When fully drained the tank is opened and the coil rack is raised and moved so as to lower it onto the truck for running into the baking oven. The cleanliness and economy of this method can be well appreciated by those who are doing a considerable amount of dipping and baking. Increased production and improved quality of the material are obtained with an absolute minimum of comparatively easy labor, and there are no messy features in the operation, as the dry coils or equipment are the only parts that are touched.

Armature dipping is done in two round tanks with plain covers. An overhead trolley passes directly above the tanks, so that armatures are handled by traveling hoists. Definite stops provided on the overhead track center the hoist directly over the tank. The stop over the first tank is removable, so that this can be taken out of the way when the second tank is used. All varnish tanks are set in a pit 3 ft. 6 in. deep.

A very novel and interesting feature has been developed to protect the armature shaft from the varnish while dipping. This is shown in an accompanying illustration. A light galvanized iron pipe of a size sufficient to accommodate the largest armature shaft is used to protect the shaft during dipping. A wooden float of 15 in. diameter by 4 in. thick is placed around the galvanized iron pipe. The float with pipe remains permanently in the armature dipping tank. When dipping an armature, the shaft enters the pipe, and as the lowering continues the base of the end bell rests on top of the float so that the entire device is carried down with the armature into the compound. The cup-shaped end bell forms an air-closed chamber so that varnish does not enter the pipe. As the armature is raised, the float follows up and assumes its original position. This method is clean and economical and is a great time-saver. It is also very popular with the men.

A special clamping mechanism is used on the armature shaft. This is shown in another illustration. This consists of a hinged steel clamp with copper gripping strips and a single clamping bolt. Chains with a ring at the top provide for attaching the hooks of the hoists. Originally a split wood block with a diagonally square hole and four clamping bolts was tried, but this proved unsatisfactory.

Thermit Welds Used in Rapid Track Reconstruction

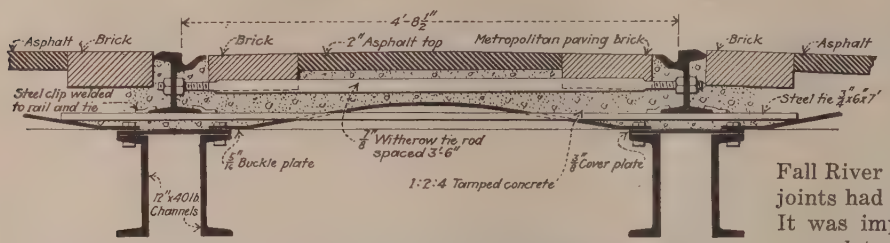
Union Street Railway Builds Three-Rail Sections at Side of Street and Installs Them During Hours When Service Is Suspended—Many Joints Welded in Open Track

DURING the past three years a complete thermit welding outfit, together with various acetylene torches and a preheating device, has been used extensively by the Union Street Railway, New Bedford, Mass., in track reconstruction work. New rails were laid in two districts of the city where it was impossible to reroute the cars during the progress of the work. Tracks were in constant use from 5 a.m. to 1 a.m. the next day, and the method followed in the reconstruction was to build up complete sections of new track alongside the existing track and to install it during the four early morning hours when service was suspended. Use of thermit welding greatly facilitated this process.

While the tracks were in service the old concrete and dirt were cleared away from the rails and ties. New rails were 7-in., 122-lb. Lorain section No. 491 in 66-ft. lengths. Three-rail sections were lined, surfaced, and welded together alongside the excavation. During the four hours when there was no service the old rails and ties were quickly removed and new ties "spotted." Then the three-rail sections were rolled into position and properly lined and surfaced. Because of using this method it was necessary to weld only four joints to complete the installation. If time was limited these joints were temporarily plated and welded the following night.

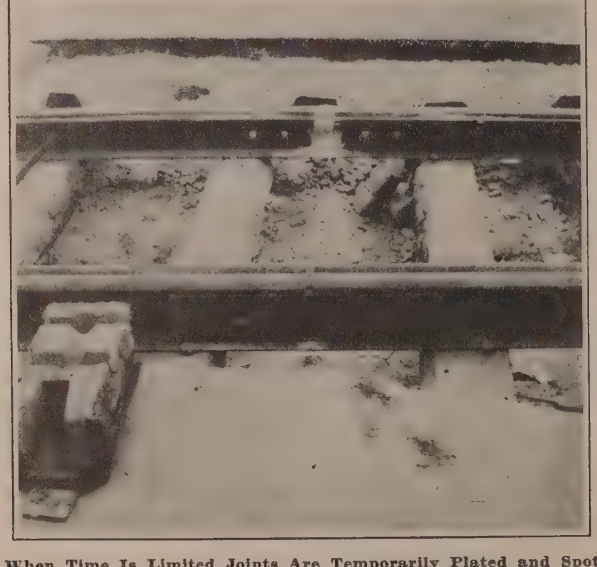
Welded Joints of This Type Are Used in Open Track Between New Bedford and Fall River

An accompanying illustration shows two joints, one a finished thermit weld and the other temporarily plated and spot welded at the base. This spot weld holds the ends of the rails in proper alignment when the plates are removed to thermit weld the joint.



Construction Used by Union Street Railway on Fairhaven Bridge. Rail Base Is Welded to Steel Ties Placed at Depressions in Buckle Plates

On the New Bedford and Fall River interurban line many of the rail joints had become badly battered or worn. It was impossible successfully to bolt on new plates due to the fact that the old plates had worn into the head of the rail. Two hundred of these were thermit-welded with an expansion joint, a regular bolted fishplate, located every 500 ft. The rail is 70-lb. T-section in 33-ft. lengths and is entirely exposed to the atmosphere. Although this thermit welding process has been in use for three years, a joint failure has yet to be experienced.



When Time Is Limited Joints Are Temporarily Plated and Spot Welded. Thermit Welding Is Done Later

Double track recently was relaid on the "mile bridge" that connects New Bedford and Fairhaven. Part of this trackwork was located on the steel bridge itself while the other part was located in a dirt fill. The same rail as in the two other districts was used. By operating on one side of the double track it was possible to discontinue service on the section under reconstruction. Before the thermit joints were made the new trackwork was concreted in except around the rail joints. By this method the rail was firmly held in position so that when the thermit metal was poured a nearly perfect butt-weld was made.

In the section on the steel bridge, the old rails had been fastened to the bridge by the use of long through bolts. It was found that many of these bolts had become loose, broken off or badly corroded. In order to overcome this difficulty the new rails were seam-welded to flat steel ties. Bethlehem Steel Company design No. 982 plates were used as it was not considered advisable to use the thermit joint on the steel bridge. The general construction of this trackwork is shown in the accompanying drawing. After the work was completed, it was allowed to set for two weeks before cars were permitted to operate over it.

Rapid Transit Line Constructed for Milwaukee

High-Speed Suburban Line and Interurban Cut-off Near Completion—Construction Involves Many Phases of Railroad Engineering Including Cuts, Fills, Grade Separations, Interesting Bridge Erection Features, as Well as Timber Trestle Work—Line Was Built in Winter Months

Steel Work Over the C., M. & St. P. Tracks and Yards and the Menominee River. The Abutment in the Foreground Marks the End of the East Fill. The Wood Trestle Is Seen in the Distance

CONSTRUCTION work is nearly finished on the town of Wauwatosa rapid transit line between the Milwaukee city limits and a point just west of West Allis. It remains only for the advent of warm weather and approximately two months of intensive work until the Milwaukee Electric Railway & Light Company will be able to put into operation Milwaukee's first rapid transit line. It will traverse a rapidly growing suburban territory and service over it will bring the city of Waukesha, 18 miles from Milwaukee, fifteen minutes closer to the city, making it virtually a suburb of Milwaukee. The analysis of traffic conditions and an outline of the survey which prompted the line's construction, together with operating features, will be dealt with in a subsequent article that will be published some time after the line is put into operation on June 1.

Leaving 35th Street, Milwaukee, at a point about 400 ft. south of Clybourn Street, the new line runs west to 37th Street, and then on a reverse curve skirts the edge of a bluff to a point of land which juts out into the Menominee Valley at the foot of Park Hill Avenue. From this point it crosses over the Chicago, Milwaukee & St. Paul Railway main line tracks, the Menominee River, the yards of the C., M. & St. P. Ry. and Aranuld Avenue on a steel structure 600 ft. long consisting of four through girder spans and one through truss span of 175 ft. The line then proceeds across the bottom lands of the valley on a timber trestle 45 ft. high and 1,800 ft. long. Passing through a portion of the National Soldiers' Home grounds it connects with the old right-of-way of the Wells-West Allis suburban line. Operating jointly with this line for about 1 mile it then continues due west and is alternately carried on fills and through cuts affording grade separation for

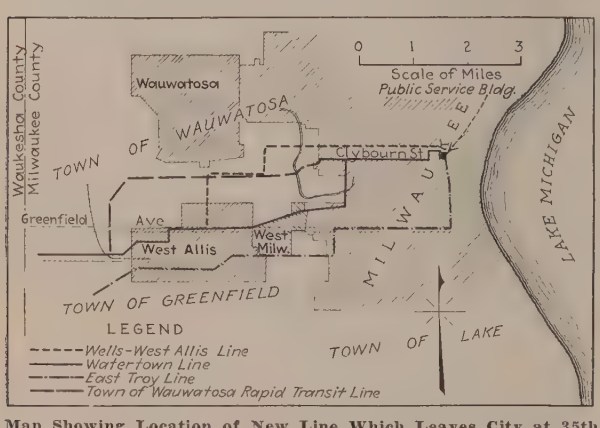
This Aerial View, with the New Route Painted in, Was Used to Show the Railroad Commission that Streets and Alleys Would Not Be Closed

all street crossings to an intersection with the present Waukesha-Oconomowoc-Watertown interurban division at a point just beyond West Allis. The new line is 5½ miles long.

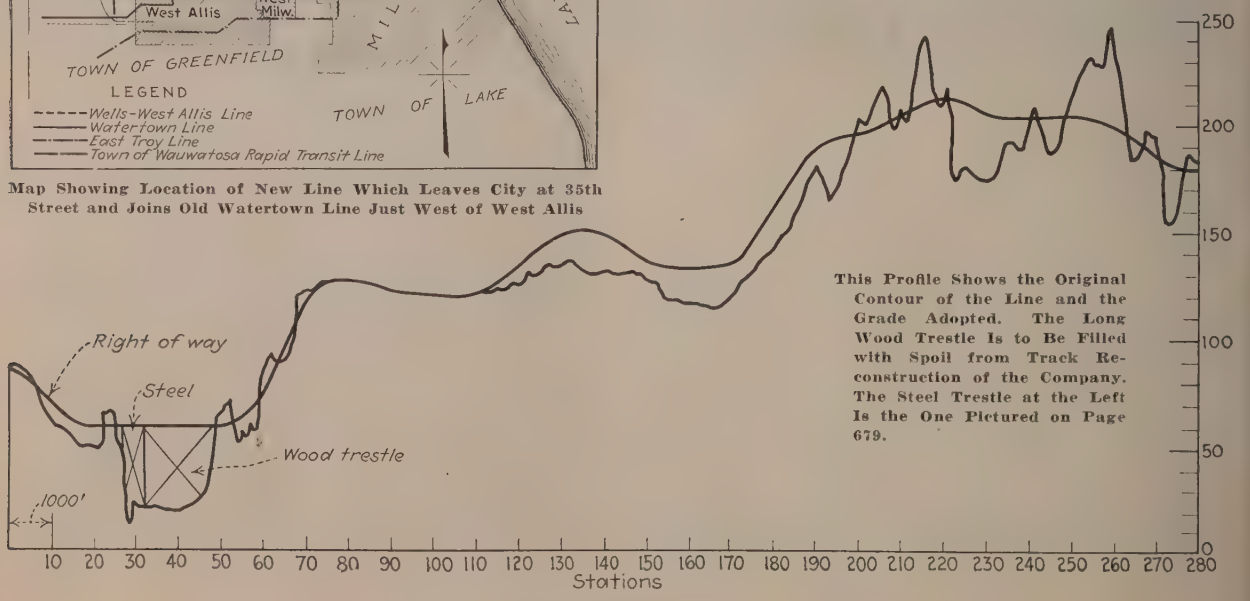
Features of the construction include the convenient approach into the city, wherein advantage was taken of the natural topography to simplify construction; the long timber trestle, built with the idea of permanent fill in the future; the extensive grading which resolved itself into a car job from a borrow pit, with a subsequent relocation of roads and viaducts; and lastly the rapidity with which the work has progressed during the winter months. Contracts for the work, representing an expenditure of $1,250,000, of which approximately $750,000 was for construction, were let during October, 1925. The survey, layout, engineering, inspection and design of all structures were handled by the engineering department of the railway. Practically all of the grading was contracted for, as was also the erection of the steel work.

Once started, the work has been carried on through the winter almost as expeditiously as during the summer, inasmuch as the major part of the material for fills was taken from a large borrow pit. This borrow was made by leveling off high hilly ground to make it suitable for residential purposes. Very few delays were encountered because of sub-zero weather.

Fifteen grade separation structures were erected, which consisted for the most part of three-span deck girder bridges, except in the case where a road through the Soldiers' Home was relocated on an elevated grade over the line with a concrete structure. Fabricated steel totaling 650 tons was employed in the large bridge across the Menominee Valley. Accompanying illustrations show this bridge, together with the wooden trestle, and the method used in placing one of the 114-ft., 80,000-lb. through girders over the main-line tracks of the Chicago, Milwaukee & St. Paul Railway. A gallows frame was mounted on a railway flat car properly supported and braced, and accurately spotted so that when the girder was raised to position it could be swung into its exact location. The other end of the girder was



Map Showing Location of New Line Which Leaves City at 35th Street and Joins Old Watertown Line Just West of West Allis



This Profile Shows the Original Contour of the Line and the Grade Adopted. The Long Wood Trestle Is to Be Filled with Spoil from Track Reconstruction of the Company. The Steel Trestle at the Left Is the One Pictured on Page 679.

raised by a derrick mounted on the partially completed overhead structure.

As previously mentioned, 1,800 ft. of the line is carried on a timber trestle. This is of standard railroad type construction with pile foundation. A timber trestle was used because it is planned ultimately to fill this portion of the right-of-way. The close proximity of this trestle to the center of Milwaukee prompted its construction, as it allows for easy transportation and disposition of the refuse and dirt removed from city track reconstruction work. It is estimated that it will take between ten and twelve years to complete this fill.

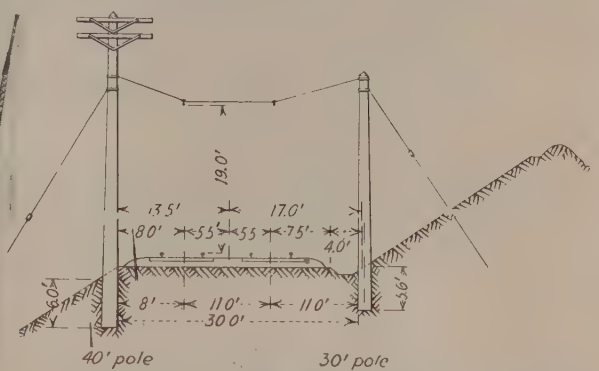
One of the extensive grading operations involved the cutting of the right-of-way around a bluff approximately 60 ft. in height. A small portion of this work remains to be completed. As soon as the grading on a portion of the line was completed, cinders to a depth of 6 in. were spread over the top. With the cinders in position, it was then possible for the company to go ahead with the track-laying work. A spur track was constructed on the Wells-West Allis interurban line at a point where the new right-of-way branches off of the old line. This siding was used by work trains.

Prior to the laying of track, however, the overhead line department went in on the frozen grade and erected the poles, span and trolley wires. Holes for the poles were dug and the poles raised into position by an earth boring machine mounted on an automobile truck. This machine averaged better than eighteen holes per day. It was followed up by a pole crew which lined up and back-filled the poles raised and set by the machine. As soon as a sufficient number of poles were erected, the cross spans, anchor guys, and No. 0000 grooved trolley wire were installed. This unusual procedure of erecting the overhead before the tracks were laid was made possible because of the frozen condition of the already completed roadbed or railway grade which permitted using the motor truck earth boring machine.

Rails delivered at the siding by the supply train were transported along the railroad grade by a small caterpillar tractor. Ties loaded on a highway trailer were also distributed by the tractor for the first track. A track gang followed assembling the track and bringing it to approximate alignment.

With one track in position and power on the trolley it was possible to utilize motor-driven work trains

A Concrete Bridge Built by the Railway to Carry the Roadway Over the Right-of-Way at a Point Where There Was a 60-Ft. Fill.



Cross-Section of Standard Type of Grading Used on Both Cut and Fill Construction. The Pole at the Left Will Carry Telephone and Feeder Cables

Center — Raising a 114-Ft., 60,000-Lb. Girder for the Trestle. The Gallows Frame on the Flat Car Was Used to Lift One End of the Girder.

Below, Left—Rails and Ties Were Hauled Into Position Over the Frozen Ground by a Caterpillar Tractor, so that the Work Was Facilitated.

Below, Right—Holes Were Drilled in the Frozen Ground by an Earth Boring Machine and Concrete Poles and Overhead Were Erected Before Laying Track.

for delivering rail and ties for the other track. This work was followed by the placing of crushed limestone ballast by Differential dump car trains. All of this rolling stock and equipment was furnished by the way and structures department utility service. The limestone was obtained from the company's own quarries on the Milwaukee Northern Railway interurban line, a subsidiary of the Milwaukee Electric Railway & Light Company.

The track is of open construction with 5-in., 80-lb. A.S.C.E. standard tee rail. Tie plates and continuous splices employing heat-treated bolts were used throughout. The rails are carried on hewn cedar ties on tangent track and on treated oak ties on all curves. This latter practice insures stability and resistance to side thrusts.

In obtaining the right-of-way into the city, the company purchased the majority of the property, only resorting to condemnation proceedings in a few cases. The location around the edge of the bluff near the city limits made it unnecessary to close or relocate streets or alleys, as none existed on the side of this hill except as were shown on recording plats. Protests were filed, however, by several property owners in the immediate vicinity, contending that the line depreciated the value of their property. These protests and the arguments, together with complaints from the city regarding vacation of certain streets and alleys, were heard by the Railroad Commission. The company supported its argument by presenting aerial photographs. A considerable number of these were taken showing the exact location of the contemplated approach to the city. The accompanying illustration showing one of these photographs indicates clearly the position of the line around the bluff referred to in the article, the St. Paul tracks, the Menominee River, and the valley or low lands. Proof was offered and substantiated by this photograph that the line did not vacate streets and alleys. The photograph did this better than would a map.

The Readers' Forum

Annual Maintenance Number Commended

CINCINNATI STREET RAILWAY

CINCINNATI, OHIO, April 7, 1926.

To the Editor:

The JOURNAL is to be congratulated on its enterprise in publishing the Annual Maintenance Number. More and more street railway operators are getting the idea that more consideration must be paid to improved equipment and devices used thereon and the presentation by the JOURNAL of what the maintenance men are doing to invite this attention on the part of operators is praiseworthy from the point of view of both the operator and the manufacturer. WALTER A. DRAPER,

President.

SAN ANTONIO PUBLIC SERVICE COMPANY

SAN ANTONIO, TEX., April 9, 1926.

To the Editor:

I am very much pleased to see the type of discussion which you have included in your Annual Maintenance Number of the ELECTRIC RAILWAY JOURNAL, March 20. Often different departments of a company develop along individualistic lines, with resulting lack of co-operation between the departments. There is one common ground which should be a cardinal principle in every department, and that is the effort to sell more rides to help make the company as a whole successful.

There are so many things that can be done in each department to increase the popularity of public transportation service that no department need lack opportunities for work in this direction. With a common aim it is quite natural that co-operation between the departments must follow. This results in co-ordinated effort by the company as a whole and an *esprit de corps* that will win. W. W. HOLDEN.

Manager Traction Department.

Would Act as Token Clearing House

PHILADELPHIA, PA., April 7, 1926.

To the Editor:

For two dollars ($2) per member per month I will act as clearing house for electric railway tokens, furnishing daily or weekly statements as required. I am a responsible property owner and can furnish bond.

The tokens could be sent to me by mail or direct to the owning company and a statement sent to me. There would be no necessity for my handling any money, as all transactions would, of course, be on a credit and debt basis. JAMES F. SHERION, JR.

Superiority of Straight-Line Operation

MOUNT VERNON, N. Y., April 3, 1926.

To the Editor:

In discussing Mr. Storrs' paper at the recent meeting of the Metropolitan Section I made reference to a London test which showed the superiority of straight-line operation to weaving in and out. The test is mentioned in "Some Aspects of Metropolitan Road and Rail Transit," a paper by H. H. Gordon, then member London County Council, read Nov. 25, 1919, and published in 1919 *Transactions* of the (British) Institution of Civil Engineers.

The test was conducted Thursday, July 16, 1914, between 8 a.m. and 8 p.m. on London Bridge, which has a carriage way of 37 ft., or enough for four lines of vehicles. There were then both "fast" and "slow" tracks, so to speak, for the traffic. Owing to failure of vehicles to keep in the assigned grooves, it was found that the bridge was congested, although used only to 41 per cent of its capacity.

Commenting on this, Mr. Gordon said:

> Watching the course of traffic shows why results fall so far short of theoretic conclusions. The assumption that vehicles follow each other in regular lines, with uniform but graduated speed in each, is far from being realized. Lumbering vehicles encroach on tracks reserved for fast traffic. For all kinds of inadequate reasons vehicles stop and cause congestion. . . . London traffic rarely proceeds in regular flow; most frequently in irregular spasms.
>
> To the traffic formula "Keep to the left" (the British rule) should be added the equally important injunction "Keep in line." If some easy method of marking the track longitudinally could be devised, and needless encroachment on more than one were made a breach of traffic regulations, a material increase in the carrying capacity of the existing highways would ensue.

While the foregoing is almost pre-automotive, the principle is there, and that's what counts.

WALTER JACKSON.

Dick Prescott Gets an Early Call

And a Cold Walk Through the Snow

DICK PRESCOTT, engineer of equipment of the Consolidated Railway & Light Company, awoke with a start one morning before daylight. For a moment he struggled to collect his befogged senses, while all the fire gongs in town seemed to be crashing in his ears. Then he finally realized that the telephone in the hall was ringing lustily.

Still half asleep, Dick stumbled to the insistent instrument and lifted the receiver hurriedly to stop the ringing before it awoke the entire family.

"Hello?" he questioned drowsily.

"Hello! That you, Dick?"

"Yes. Who in the world is this?"

"This is Steve White," answered his good friend the carpenter shop foreman. "It's been snowing to beat the band all night, Dick, and we're shorthanded here with a busted plow. You're fairly close to the shop and I wondered if you could get down to give us a hand."

"Sure I'll get down!" exclaimed the now thoroughly awake young engineer. "Any cars running on Fourth Street?"

"Don't know, Dick. Most of us have been up all night, but we've had our hands full here. She's snowing like the North Pole got lost."

"All right, Steve. I'll be along as soon as I can make it. See you later."

"Say," called Steve, as Dick was about to hang up. "Don't stop for any breakfast. We've got a coffee pot going here and lots of sandwiches."

Dick hurried into his clothes, found a pair of overshoes and quietly slipped out of the house. He looked at his watch and noticed that it was a quarter past three. A blast of wind-driven snow greeted him at the door and he sank to his knees as he stepped into a deep drift on the walk.

"Gee!" he exclaimed, glancing up and down the white-shrouded street. "This is a real storm!"

He tucked up his collar and made his way to the corner. A heavy bank on each side of the street showed that the sweepers had gone through, but the badly drifted tracks indicated that some time had elapsed since the line had been covered.

"Looks like it's getting the best of them," Dick muttered. "Guess I'd better hike it."

Keeping to the center of the street, he braced himself to the storm and started toward the shop. It was hard going, but he made progress. He warmed to the task and soon forgot the chill of the wind as he plodded his lonely way along the storm-blown, deserted street.

Suddenly, through the gloom ahead, a dim headlight faintly glowed and he could hear the tinkle of a snow-choked gong. He looked closer and could distinguish the ghost-like outline of a sweeper slowly making its way in a self-created cloud kicked up by its whirling brooms. When the sweeper came closer, Dick recognized in the figure hunched over the controller grizzly "Pop" Jones, veteran of many years with the Consolidated, now eagerly peering through his snow-smeared window, intent on his important task.

"Pretty bad night," called Dick above the swish of the brooms, at the same time waving his arm over his head.

"Howdy!" yelled Pop, stopping his car and leaning out to make himself heard. "What you doin' up so early, Dick?"

"Going down to give them a hand at the shop. How are things going?"

"Pretty good! We'll make it all right now if it don't come much harder. Just got out of the shop in time, though. Another half hour and she'd 'a' had us whipped on this line."

"What happened?"

"Burned out an armature. Say, you ought to have seen that gang at the shop put us back in commission! Better shake a leg, boy, they got a plow busted and they need help. They're workin' back there like hell broke loose. Got to keep goin', Dick, so long!"

Dick instinctively quickened his pace. He thrilled at the thought of taking an active part in this struggle against the elements—an unseen part, but vital nevertheless. As he approached the shop there ran through his mind the words of old Pop Jones: "They put us back in commission"—hours and fatigue forgotten in the job of keeping the lines open so that those who still slept comfortably would find convenient transportation in the morning.

"This is sure a game of teamwork," thought Dick. "That's the backbone of this idea of selling transportation. Few people will think of that gang at the shop, but they are entitled to a good share of the credit for keeping this line open tonight."

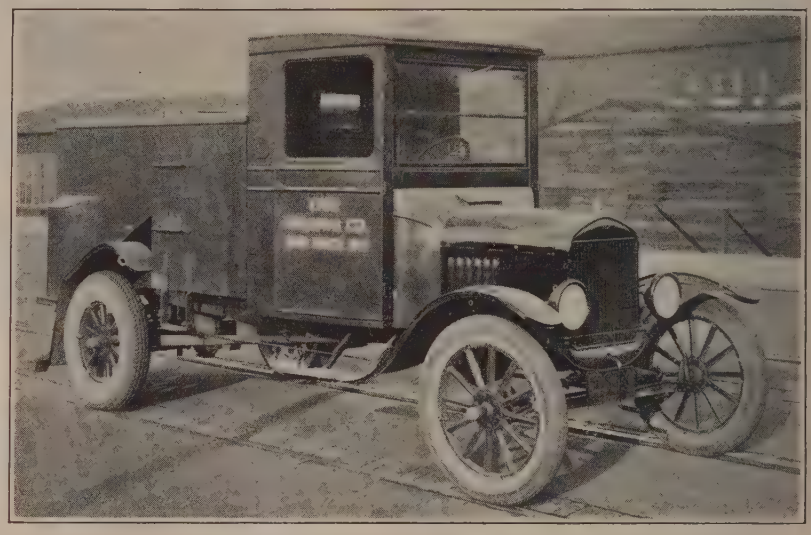
Maintenance Notes

Ford Truck Solves Sanding Problem in Erie

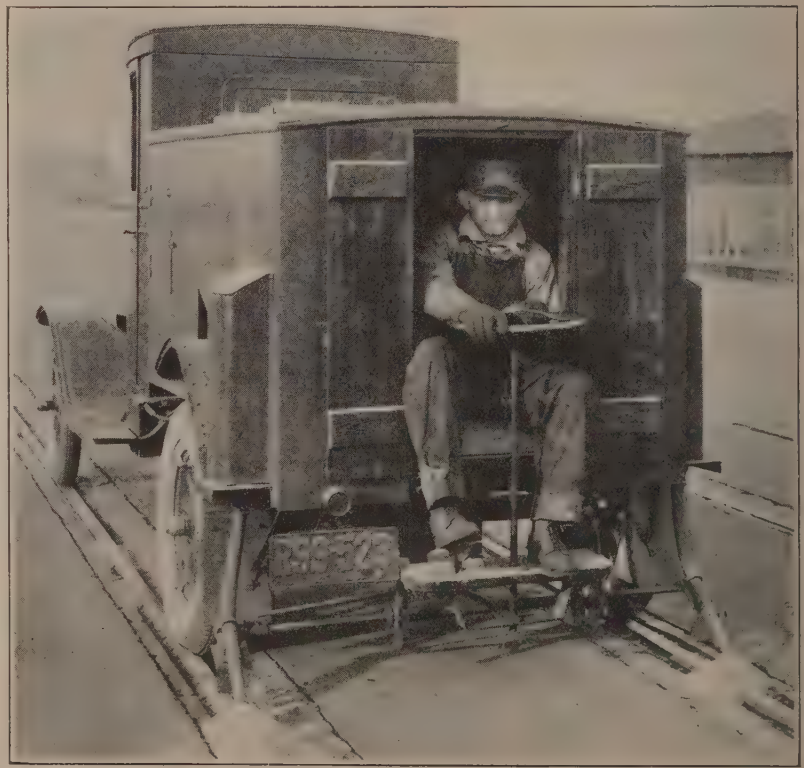
FOR sanding electric car tracks and also sanding the roadway where buses operate during icy or slippery weather, the Erie Railway, Erie, Pa., now uses a 1-ton Ford truck. The arrangement of bins for carrying sand and the mechanism for operating the sand valves and distributing the sand were built in the company's shops under the supervision of P. J. Wood, superintendent of equipment.

The sand hopper has a bottom constructed of No. 20 gage steel and this slopes at an angle of approximately 45 deg. from the back of the driver's cab to the rear end of the truck. At the rear a V-shaped compartment is constructed large enough for a man to sit in so as to direct the sanding and operate the sanding valves. An accompanying illustration shows the rear end of the truck with the operator in position. This illustration shows the truck on the car tracks, but in operation it is not necessary to follow the car track very closely, as the sanding hose on either side at the rear can be moved back and forth a distance of 18 in. on either side of the rails. This makes a very flexible arrangement. The sidewise movement of the sand hose is obtained by the operator turning a hand wheel mounted at the top of a vertical shaft. The lower end of the shaft has a bell-crank lever which attaches to a ¾-in. square sliding shaft. The ends of this square shaft have clamps which are attached to the two sanding hose. There are four bearings for the square shaft. Those at the end are supported from long hangers which reach back to the center framing. The two bearings on either side of the step are supported by strap hangers, which drop down from the step.

These bearings are also arranged so that the hose can be moved vertically. The square rod slides in a hole in a circular center part of the bearing. This bearing itself will also rotate inside its housing. This enables the two hose to be lifted up by moving a lever which can be seen at the right hand side of the step in the rear view of the truck. This raising of the hose is of particular convenience when returning along a route which has already been sanded or when cutting across from one line to another in a section where sanding is not required. With this flexible arrangement, it is easy for the operator to direct the sand hose



Sanding of Tracks and Roadways and the Salting of Switches Are Carried Out Most Efficiently in Erie, Pa., by This Truck



The Rear of the Sanding Truck Has a V-Shaped Compartment for the Operator, Who Directs the Sand to the Track by a Hand Wheel and Regulates the Flow by a Pedal

so as to strike the rails during operation at the full speed of the truck. Sanding can thus be carried out very rapidly.

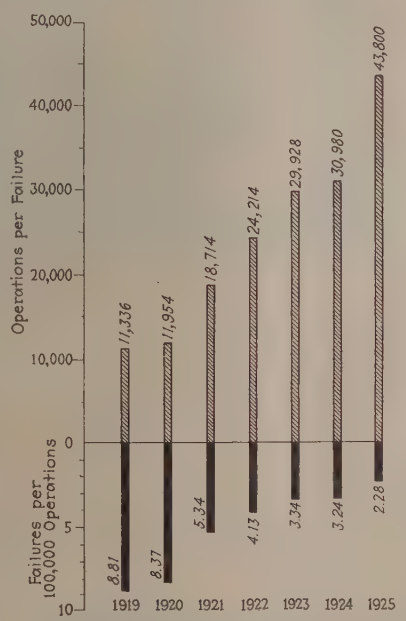
The hopper holds 1 cu.yd. of sand. The flow of sand into the sand hose is regulated by a slide on each side just at the top of the hose. Movement of the slide back and forth is governed by a pedal attached to the step. Pressure of the operator's foot causes more sand to flow, and by raising his foot the opening is reduced or shut off as desired. The operating mechanism for the slides consists of a bell-crank lever attached to the rear end of the pedal. This in turn is attached to two rods which hook into the ends of the slides. Both slides move in the same direction to open and in the reverse direction to close the opening. The hose used to receive the sand as it comes from the hopper is 1½ in. diameter. A wrought iron pipe is attached to the lower end of each hose. This is flattened out at the bottom end, so as to provide an opening ¼ in. wide. This construction is for sanding the track rail. When it is desired to sand a wide area, such as is necessary for operation of buses during slippery conditions, the two wrought iron pipes are replaced with a special nozzle. This is fanned out at the end to a distance of 6 in. on the inside and 12 in. on the outside, making the total width of the nozzles at the ends 18 in. In order to direct the flow of sand, the inside of the nozzle has louvres, so that the sand as it comes from the hose falls into these louvres and thus has a uniform distribution along the entire width of the nozzle. One-quarter inch square openings are provided for the sand to come out. This nozzle of course can be moved back and forth by turning the hand wheel in a manner similar to that described for track sanding and, by rapid operation, a considerable distance either side of the roadway will be sanded.

In the illustration showing the rear end of the truck two shields will be seen attached to the lower end of the sanding hose. These keep wheel wash from interfering with the flow of sand as it comes out of the nozzle. The V-shaped compartment at the end is provided with a seat for the workman and with two doors and a catch, so that this can be locked when not in use. The hand wheel can be lifted off and placed in the compartment, and this can also be used for keeping the workman's overalls and clothing. Buzzers and push buttons are installed at the side of the driver and also at the side of the operator. These are used for signaling, so that the driver can warn the operator when it is necessary for him to pull away from the track or to stop entirely. The operator can also signal the driver when necessary.

In addition to carrying sand for the tracks and roadway, this truck is also used for salting switches during severe weather conditions. A bin for salt is built underneath the back of the hopper. In salting switches, the salt can be removed by a shovel or a bucket can be filled and the salt then applied by the workman in the usual manner.

Signal Operation in Chattanooga Still Better

CAREFUL signal maintenance on the Tennessee Electric Power Company's lines at Chattanooga, Tenn., has resulted in a material reduction in failures, as is evidenced in the annual report of the signal department for 1925.



A Progressive Improvement in Signal Operation in Chattanooga Is Shown for the Years 1919-1925

In the accompanying table is given a list of the troubles.

In all the 42 Nachod signals in service there were but 49 cases of trouble, during which time the signals operated 2,146,200 times, which is at the rate of one interruption for each 43,800 movements. These signals are quite old, some having been installed seventeen years ago, and they have been in continuous service.

Trouble Found	1925	1924
Line wires	6	6
Fuses and storms	4	7
Lamps out	5	10
Relay trouble	14	11
Setting contactors	6	5
Clearing contactors	4	1
Bad ground	6	7
Pole wiring	2	8
No trouble found	0	5
Miscellaneous	2	6
Total	49	66
Number of blocks in service	21	21
Total yearly operations of all signals	2,146,200	2,044,680
Number of operations per interruption	43,800	30,980
Average daily operation per block of signals	282	266
Average yearly operation per block of signals	102,200	97,746

An annual record of the signal operations has been published in the issues of ELECTRIC RAILWAY JOURNAL for March 19, 1921; March 18, 1922; Feb. 10, 1923; March 1, 1924; May 16, 1925.

The successive yearly betterment in the signal operation is shown by the graphs.

Wide Gaging Wheels in New Orleans

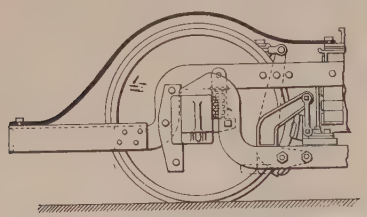
METHODS of changing a long section of track in New Orleans from 4-ft. 8½-in. to 5-ft. 2½-in. gage were given in an article in the issue of this paper for April 3. This change has been made as part of the policy of the New Orleans Public Service, Inc., to use a wide gage on all of the tracks of its system. Obviously, the change of track gage on part of the system meant a corresponding change of wheel gage on a considerable number of the cars of the company. This work has been conducted in the repair shop. It did not have to be completed in so short a time as the change of a section of track, which had to be done overnight.

For years the New Orleans system has had tracks of two gages, and still uses the narrower gage track on one important line. Consequently, some of its cars have standard-gage and some wide-gage trucks.

When the change of track gage became imminent, a certain number of standard-gage cars were designated for change of gage. No change had to be made in the truck frame because it was wide enough to accommodate the wide-gage wheels. In consequence, the same axle was used, and the only work necessary was to move the wheels farther apart and to move the brake rigging, including the hangers and brakeshoes. As this change has been expected for a number of years the wheel seats on the axles were wide enough to permit spreading the wheels.

Mud Guard Protects Resistors

PROTECTION of the resistance grids and the air compressor from injurious mud splashing has been secured on certain cars of the Public Service Railway, Newark, N. J., by means of an ingenious



Home-Made Mud Guard Fastened to Truck Frame Protects Resistance Grid from Splash

guard. The type of truck on which this device is used is the Standard 0-50. A piece of 6-in. flat iron was welded between two 1-in. angle irons to form the guard. This was bent to a semi-circular shape to conform to the outer edge of the wheel. One end of the splasher is bolted to the end of the truck frame, while the other end is attached to the truck bolster. Approximately 2-in. clearance is allowed between the wheel and the guard. On account of this close fit there has been no difficulty with securing clearance under the car body frame.

Steel Frames Make Neat Car Signs

FOR announcements inside cars the Grand Rapids Railway, Grand Rapids, Mich., uses cardboard signs 8 in. x 25 in. in size, with a 1-in. border all around. An attractive holder is provided for the signs by using a sheet-steel frame with a slot at the top for inserting the card. The frame is made of 1¾-in. steel

Announcements Inside Cars of the Grand Rapids Railway Are Held in Neat Sheet Steel Frames

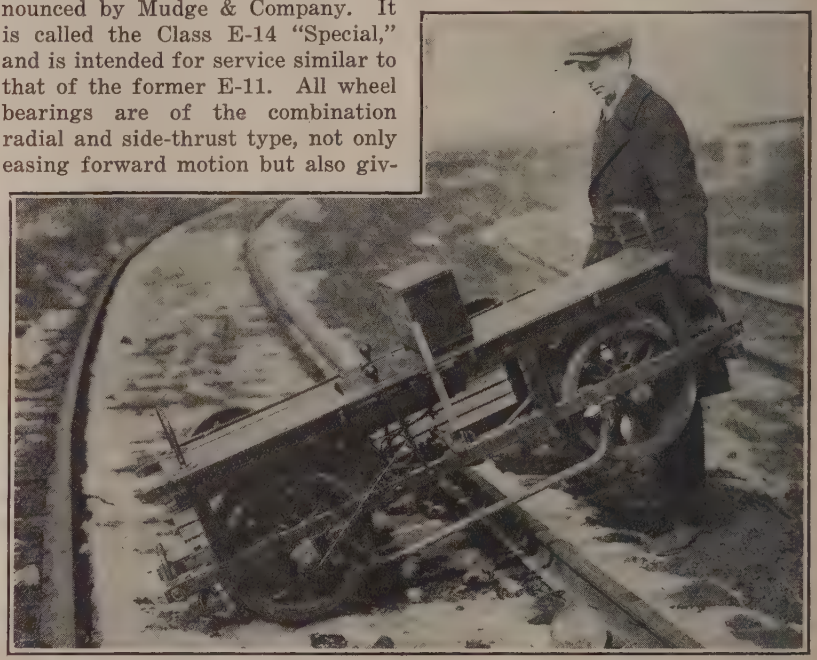
stock which is bent to form the two sides each ¾ in. wide. The sides and ends are welded together.

Two eyes are riveted to the top corners. These are placed over hooks in the center of the headlining inside a car, so that two signs can be read from either side.

New Equipment Available

Light Inspection Car Has Roller Bearings

AN IMPROVED light-weight car for inspection and light repair work on interurban lines, and equipped with roller bearings throughout, has recently been announced by Mudge & Company. It is called the Class E-14 "Special," and is intended for service similar to that of the former E-11. All wheel bearings are of the combination radial and side-thrust type, not only easing forward motion but also giving roller-bearing protection against side sways of the car. Thus the 4-hp. Mudge Class E engine is able to deliver additional power because of the decided reduction that has been made in friction.



Lightness and Reduction in Friction by Use of Roller Bearings Are Features of This Handy Inspection Car

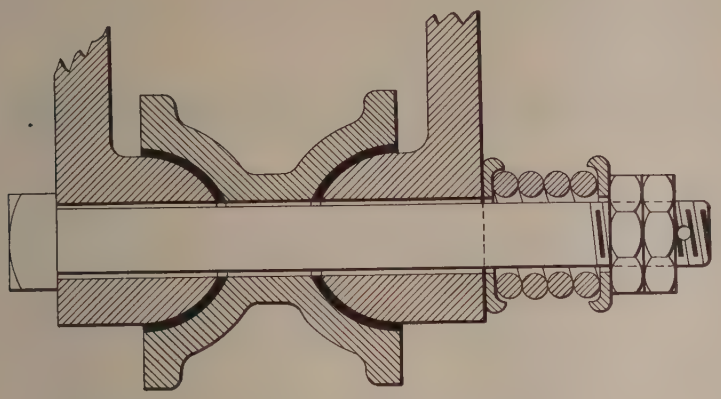
Two decided improvements have been made in the interests of safety. The car is so designed as to permit placing the tool tray on the side of the frame immediately next to the guide wheels, giving the car an additional balance which was lacking in former cars of this type. Moreover, the wheels have been placed at an angle rather than in parallel planes, so that as the car advances on the rails the wheels tend to hug the sides and to hold the car down. The faster the car travels the stronger the downward pull.

Self-equalizing brakes, acting on both drive wheels, are used. These brakes automatically adjust themselves for wear, so that the braking action is always equal on both brakes. Improvement has been made in the brake lock. It is not necessary to chuck a rock or piece of wood under the wheels when the operator leaves the car temporarily to do his work. He needs only to pull back the brake and place the brake lever in the notch, locking it securely and preventing the car from traveling.

Skids and iron handles on both ends of the car are provided as standard equipment to facilitate removal from the rails. The car can be quickly rolled aside by the operator by taking hold of either end, so that in an emergency he can work rapidly.

Welded-in Bushings for Half-Ball Hangers

HARDENED steel bushings welded to the hanger holder castings of the half-ball type of brake hanger are now being furnished by the J. G. Brill Company, Philadelphia, Pa. These bushings are made of No. 14 gage steel, specially hardened. They are manufactured to fit tightly into the hanger holder castings and shoe holders, in which they are held by a special half-ball clamp while they are being spot welded at four points on the edge of the bushing and casting. This change from previous designs was



Hardened Steel Bushings Spot Welded to Hanger Holder Casting

made so that the bushing in the socket will take the wear and when desired may be replaced readily at a minimum expense rather than to require the scrapping of the whole hanger holder casting or shoe holder. This type of construction should result in consistently effective performance in addition to reducing maintenance cost.

First Single-Motor Gas-Electric Bus

WHILE several innovations in gas-electric bus design were made by the International Motor Company in placing its first gas-electric Mack bus on the market, many of the standard features in design of the city type bus are retained completely in the new gas-electric unit. Important among these is the standard Mack rear axle, which is retained because the single driving motor is coupled directly to the drive shaft. Previously, all gas-electric buses developed and marketed commercially have been equipped with twin driving motors, one driving each of the rear wheels.

The features of the new equipment are the elimination of considerable weight and the retention of a single propeller shaft. The manufacturers state it to be their belief that material reductions in maintenance costs will be effected through the simplification of the power plant and the driving equipment. The emergency brake lever has been eliminated as unnecessary and the operation of the emergency brake has been transferred to a foot pedal.

Electrical equipment for the new bus is manufactured by the General Electric Company. It consists of a DT-1105 generator, rated at 125 volts, 200 amp. at 1,200 r.p.m., a G.E. 1101 motor rated at 125 volts, 140 amp. at 1,100 r.p.m., and a street car type controller, consisting of a drum type switch to give proper connections for forward and reverse and for emergency electric braking. The generator is self-excited by a shunt winding, also by a small series winding so connected that as the load increases the field strength is automatically kept up and the desired operating characteristics are thus maintained.

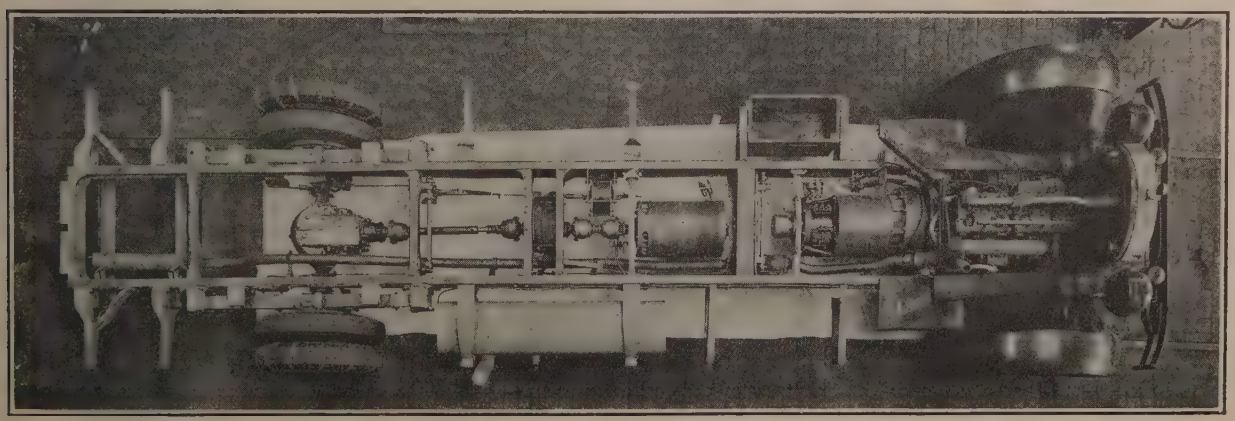
There is also a small field winding on a separate circuit from the main winding. This is fed from a 12-volt starting battery, taking less than 1 amp., its function being to provide a small initial excitation so that when the throttle is opened suddenly the generator will instantly respond.

The added weight of the electric unit over the standard parts which they replace is stated to be approximately 1,400 lb., making the weight of the 25-passenger bus empty 11,300 lb., and the 29-passenger empty 12,130 lb.

As the generator in the Mack gas-electric bus occupies the place of the transmission in the gear-drive unit, the hand brake lever is dispensed with and the right pedal, formerly the service brake, is connected to the emergency brake on the propeller shaft. This propeller shaft brake in the bus operates independently of the service brake, which acts on rear wheel drums.

Although the motor on the new bus has been so installed that it does not protrude above the flooring of the unit, none of the ground clearance has been lost. The clearance is 9½ in., identical with that in the standard gasoline bus. The value of ample clearance in buses has been demonstrated where buses have operated during heavy snowfalls. Units provided with high clearance proved generally satisfactory in maintaining schedules during the winter.

The engine of the bus is mounted on rubber shock insulators in practically the same manner as the springs. The generator is supported by a cross-member attached to the frame by means of steel incased rubber blocks, while a single electric motor is supported at three points by shock insulators. This installation reduces to a minimum the shock of uneven roadbeds, reduces the vibration of fast-running engine and motor and deadens mechanical noise considerably. In general, the aim of Mack engineers has been to adapt the gas-electric principle to standard equipment rather than to develop an entirely new bus throughout.



Placing a Single Motor on the Driveshaft Has Made It Possible to Retain the Standard Mack Rear Axle

Association News & Discussions

Making the Utility Man a Better Public Servant

At Galveston Convention of Southwestern Public Service Association Many Topics for Improving Operation and Gaining Good Will Were Discussed

PROGRESSIVENESS and a desire to perform better the duties of a public servant permeated the proceedings of the Galveston convention. In that city were assembled delegates from the many companies in the great Southwest forming the joint annual convention of the Southwestern Public Service Association and the Southwestern geographic division of the National Electric Light Association. This was the 31st annual meeting of the former and the sixth annual meeting of this N.E.L.A. Division.

Of outstanding interest to the railway delegates and visitors was the extent to which the women of the industry have been brought into the service of the utilities in helping to put across the companies' message, selling securities and establishing that good will so fundamental in public relations work. The talks and demonstrations by the women delegates of the utility companies were an open invitation to the railway fraternity to follow a good example.

Merchandising transportation on railway cars occupied an entire afternoon under the leadership of Chairman W. W. Holden, superintendent of transportation, San Antonio Public Service Company, San Antonio, Tex. George H. Clifford, Southwestern district manager Stone & Webster, in a paper on methods of encouraging car riding, gave as his belief that the time had passed when the railway manager need worry about the automobile situation. Street limitations and traffic congestion are now the limiting factors and the riding throughout the country is having a tendency upward. It probably will continue despite the increasing number of automobiles sold. In fact, the riding habit thus developed furnishes the greatest field for increasing business. Mr. Clifford laid great stress on the necessity of providing means of limiting street congestion and obtaining greater speed of cars and buses as being of basic importance in the building of traffic. Real estate owners are beginning to realize the importance of faster transportation as a definite element that concerns their operations.

Buses Build New Business

Proper use of buses by railway operators is also an important element of building new business. He gave it as his opinion that many of the old prejudices, such as the popular idea that railways congest the streets and that the traffic and parking regulations are desired for the selfish success of the street railways, must be broken down by showing that the cars not only serve the masses but serve them more efficiently than any other means of transportation known today.

H. B. Flowers, president New Orleans Public Service, Inc., in discussing this subject gave his views in one of the shortest talks of the convention. He said the details were not important as compared with the knowledge that the street car, once the fastest means of street transportation, was now the slowest. Today we must either scratch gravel or quit. However severe the jolt may be, he believes it will redound to the ultimate good of the industry. It should be perfectly possible to evolve a system of street car and bus transportation that will be the fastest means. Cars and buses must not only accelerate quicker but must travel at higher speeds than private cars. Easy-riding cars and comfortable seats, as well as a smooth track, are necessary not only to accomplish this greater speed but as a means of winning the traffic in competition with the private automobile.

Walter H. Burke, local manager Northern Texas Traction Company, Fort Worth, spoke against the boulevard system of stops when the boulevard is a street used by electric cars. In Fort Worth it was found better to establish this arrangement on streets adjoining the railway streets.

Know the Facts, Says Frank Coates

Frank R. Coates, president American Electric Railway Association, discussed the question, saying that it was of great importance that transportation men know the facts of the industry and use them correctly in the public talks given before the local communities. Many skeleton talks were being prepared by the A.E.R.A. for use of member companies.

As rolling stock plays an important part in the selling of transportation many equipment men told of the practices of their local companies. Among these men were F. J. Bennett, Houston, Tex.; C. O. Rushing, Shreveport, La.; and H. C. Pressler, Beaumont, Tex.

Likewise the preparation of schedules is also important in this connection, as told by T. A. Owens, Dallas, Tex., and W. R. Castle, San Antonio, Tex.

Tom P. Walker, local manager El Paso Electric Railway, spoke of personality as being the complement to good service. While composed of a multitude of little things, he said, this was a big factor in itself. Good will, courtesy, humanity, the promotion of safety and a smile were the important elements of this intangible quality.

Dallas Publicity Methods

C. J. Crampton, manager publicity department Dallas Railway, gave many details of the practices of his company. All stories of accidents are given promptly to the newspapers, as are also all items and stories of news. The background of publicity is the newspaper. He finds it of far greater value than

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 21—Central Electric Traffic Association, special meeting, Keenan Hotel, Fort Wayne, Ind., 9 a.m.

April 22—Central Electric Railway Accountants' Association, special meeting, Keenan Hotel, Fort Wayne, Ind., 9 a.m.

April 21-23—American Welding Society, annual meeting, Engineering Societies Building, 29 West 39th Street, New York City.

April 23—Metropolitan Section, American Institute of Electrical Engineers, Engineering Societies Building, New York City, 8 p.m.

April 30—National Highway Traffic Association, annual meeting, Automobile Club of America, New York City.

May 7—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York City, 8 p.m.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 25-26—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

August 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wisconsin.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

spreading advertising over a wide range of small-circulation or one-time publications. The radio is another means of creating a wider knowledge of publicity material. His department was characterized by himself as a small lyceum for the furnishing of public speakers for all occasions.

Of outstanding importance has been the work of the Junior Safety Council among school children of lower than high school grade. Juvenile accidents have practically been eliminated due to the activities of this group of school children. The public relations department cannot do it all. Every employee is invited to send in advertising suggestions. Five dollars is paid for each suggestion used and the employee's name appears signed to each advertisement published.

James P. Griffin, vice-president Texas Electric Railway, Dallas, spoke of the importance of adjusting rates to fit all conditions. A special party of any number may now have a private car on a tariff constructed to meet different sized parties. Tickets have been placed on sale at colleges and excellent results have thus been obtained. An advertising council has been formed on this property that will aid in the expenditure of double last year's appropriation. Newspapers, billboards and other means of publicity are being used.

Customer and Employee Ownership Commended

During the joint session Wednesday morning Ralph S. Child of Bonbright & Company delivered a paper on public utility financing, in which he commended the activities of public utilities in the sale of stock to employees and customers. In 1925 the billion and a half dollars of utility financing was twice that of three years ago and a third of all money raised for corporate financing. In discussing the basis of utility financing, Mr. Child made a plea for sound economic study and the preparation of tentative budgets five to ten years in advance of actual requirements. Investment bankers look with disfavor on financing utilities of any kind into competitive territories.

One of the most interesting features of the railway section meeting was the discussion of traffic by police officials of eight cities in the Southwestern district. Stanley Good, captain of traffic, El Paso, made a plea for closer co-operation with railway officials. Elimination of parking was stated by Captain Good as well as other police officials who followed him as being the most important element of the traffic problem. Since the cars were the largest public servants, the police officials in the performance of their duty to the public must move the cars quickly, even at the expense of the private automobile There is no question but that the traffic officials of the Southwestern cities are making great strides in the solution of this difficulty.

James W. Welsh, executive secretary American Electric Railway Association, talked on bus operation and the ways that this vehicle can serve the railways.

Traffic regulation in Chicago and other cities, with particular reference to control signal, was discussed by Claude Van Auken of Chicago and John Dewhurst of New York.

Harold E. Broten, vice-president Mineral Wells Electric Company, was elected president of the Southwestern Public Service Association, and W. H. Burke, general manager Northern Texas Traction Company, was elected chairman of the railway section.

The total attendance of both associations was 572, the largest ever at a meeting of the combined bodies.

C.E.R.A. Announces Plans for Boat Trip

SUB-COMMITTEES for the annual meeting have been announced by President G. K. Jeffries of the Central Electric Railway Association. These include the hotel and arrangements committee and sub-committees for the principal cities in the territory. The list follows:

Hotel and Arrangements—J. H. Drew, chairman; John Benham, J. A. Donahey, L. P. Morris, C. C. Creighton, C. L. Van Auken, E. S. Gunn, Charles Gordon.

Sub-committees: Cleveland-Akron—R. W. Emerson, chairman; F. H. Wilson, L. G. Tighe, Frank Campbell, W. F. Healy, R. C. Snell, J. H. Walker.

Detroit—W. S. Rodger, chairman; E. J. Smith, A. H. Ferrandou, Dean MacLaughlin.

Chicago—L. E. Gould, chairman; O. A. Broten, C. F. Dougall, R. R. Holden, R. J. Deneen.

Cincinnati—J. B. Stewart, Jr., chairman; A. G. Olberding, A. L. Kasemier.

Dayton—J. H. McClure, chairman; T. A. Ferneding, J. R. Johnston, W. B. Fincher.

Indianapolis—L. M. Brown, chairman; T. H. Nichol, W. F. Graves, W. D. Hamer, T. H. David, H. E. Rassmussen.

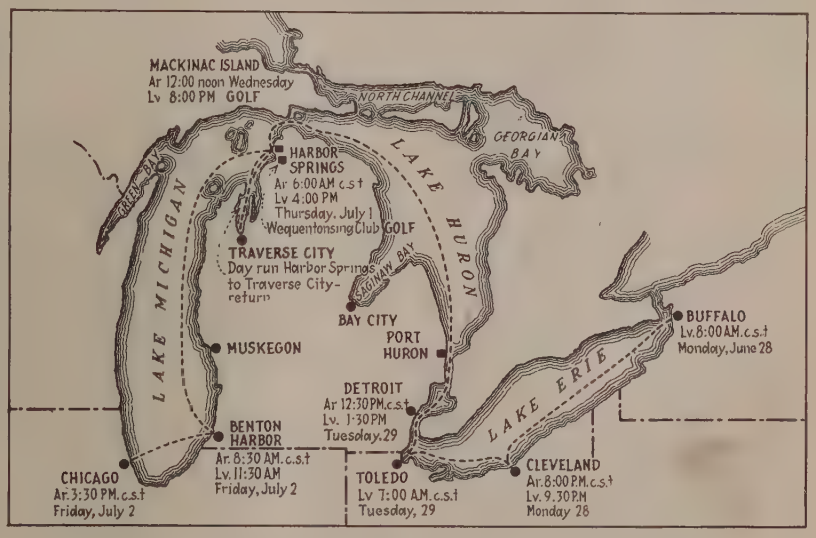
Sandusky - Toledo — M. A. Ackerman, chairman; J. F. Johnson, C. T. DeHore, H. O. Kelley.

Pittsburgh—C. D. Smith, chairman; W. H. Boyce, M. B. Lambert, H. W. Kilkenny.

Columbus—Lawrence Wilcox, chairman; C. C. Slater, A. F. Van Deinse.

St. Louis—G. L. Kippenberger, S. W. Crawford.

Several slight changes have been made in the schedule of the trip from that published in this paper for March 13. The new itinerary is being sent out in the form of a map, a reproduction of which is shown on this page. Central standard time is used throughout this trip.



Itinerary of C.E.R.A. Boat Trip. Note that Central Time Is Used

Engineers Needed for Executive Positions

Technical Education Is Valuable to the Modern Business Administrator—Qualifications for Engineer Executive Outlined

ENGINEERING is the most important new factor which has been introduced into our everyday life during the past 50 years, and it seems reasonable to believe that a substantial majority of the successful business executives of the future will come from the ranks of those who have had technical training. This was the consensus of opinion expressed by the speakers at a joint meeting of the Metropolitan Sections of the four Founder Societies before an audience that filled the large auditorium of the Engineering Societies building in New York City on the evening of April 14.

The speakers were E. M. Herr, president Westinghouse Electric & Manufacturing Company; H. A. Guess, vice-president American Smelting & Refining Company; Dr. F. B. Jewett, vice-president American Telephone & Telegraph Company, and J. C. Parker, vice-president and chief engineer Brooklyn Edison Company.

All agreed that the qualifications for a good executive include the ability to lead and direct, initiative, energy, courage and knowledge of the human side of business. These qualifications must be inborn and cannot be instilled solely by education. They can, however, be developed and strengthened by this means. Engineering education should give the student thorough knowledge of the fundamentals and should include also study of the humanities.

Describing the qualifications which the engineer should have, Mr. Herr mentioned the ability to lead and direct others, decision and initiative, the ability to evaluate men and materials, the willingness to assume responsibility and the ability to make economic decisions. He emphasized particularly that the engineer should not neglect cultural studies, as the human side of

business is just as important as the technical side. In addition to the cultural studies and humanities, an engineering education should include a thorough study of the fundamentals and some attention to the principles of special industries.

Prefacing his remarks by the statement that they applied particularly to mining and metallurgical engineering, Mr. Guess said that the apparently greater number of lawyers and business men occupying executive positions might be accounted for by the fact that the total number of such professional men is greater than the number of engineers. In his opinion, the engineering profession is filling its proportionate share of executive positions. His ideas of the qualifications which an engineer should possess coincide closely with those of Mr. Herr. He, too, believed that these qualities must be inborn to a large extent. Detailed study of particular engineering subjects need not be included in the educational program of the engineer, but he should get sufficient information along these lines to enable him to earn a living.

Specialization in technical work in the past has kept many good engineers out of executive positions, according to Dr. Jewett. In the future, however, he believes that this tendency will be less marked and that the successful executives will be drawn in a large measure from the ranks of those who have had engineering training. He stressed the necessity of making a conscious effort to seek out promising men for future selection as executives.

The first qualification for an engineer as an executive is that he be a good engineer, Mr. Parker said. Knowledge of the fundamentals is essential, but too great a knowledge of detail is likely to be a disadvantage rather than an advantage. He spoke of the danger of becoming so absorbed in the technique of engineering that the real reasons for doing the job were forgotten. Consideration of the human side of industry is highly important, he said. Most men respond in the spirit in which they are approached, and it is essential that the executive have a good working knowledge of the human side of business.

Wire and Sheet Metal Gages to Be Unified

ELIMINATION of the confusion caused by 30 wire and sheet metal gage systems now in use in this country is to be brought about as the result of a conference held on March 18 in New York City, and attended by representatives of 25 organizations, including the A.E.R.A., interested in all phases of the subject, which includes wires, sheets and tubes of metals of all kinds. Unanimous decision was reached that the confusion brought about by the existence of the numerous conflicting gage systems has become intolerable, and that industrial practice should be unified in a simple consistent plan. The detailed technical work will be in the hands of a sectional committee broadly representing all interested industrial groups and working under the American Engineering Standards Committee.

The trend of opinion at the conference strongly favored the elimination of all gage numbers and the use of a simple system of designating sizes in decimals of an inch. The decision, however, on the exact form of the solution was left to the sectional committee, the scope of whose work was outlined as follows:

The standardization of a method of designating the diameter of metal and metal alloy wire, the thickness of metals and metal alloys in sheet, plate and strip form and wall thickness of tubing, piping and casing made of these materials; and the establishment of a standard series, or standard series, of nominal sizes and of tolerances for wires, sheets, plates and strips.

American Association News

Traffic Congestion

POINTS to be covered in the final report of the committee on traffic congestion were discused at a meeting held on April 2 at Cleveland, Ohio. It was suggested that this final report should contain (a) excerpts from the report of the National Conference on Street and Highway Safety; (b) portions of the report of the 1925 committee on traffic congestion, and (c) the model traffic ordinance adopted several years ago by the committee on code of traffic principles.

A sub-committee consisting of A. J. Fink, R. W. Emerson and C. H. Evenson was appointed to analyze the report of the National Conference on Street and Highway Safety.

Progress was reported in the matter of department store checks to determine the means of transportation used by customers in reaching the stores. It has developed, however, that some stores object to making such a check on account of the comparatively small number of patrons using automobiles.

Toledo, Ohio, was selected for the next meeting, to be held June 4. Those present were C. D. Smith, A. J. Fink, E. S. Rider, R. W. Emerson, J. A. Greig, J. P. Tretton, P. E. Wilson, sponsor, and A. R. Myers, chairman.

Power Generation

REVIEW of the work of its subcommittees was made at the meeting of the power generation and conversion committee of the Engineering Association, held on April 1-2 at association headquarters in New York City. The committee's report this year will be divided into four sections. First, will be a review of existing manual substations; second, existing practices in design and operation of automatic substations, including remote and supervisory control. The third subject is the application, characteristics and present status of the mercury arc power rectifier; and the fourth and final section of the report will be on the ventilation and reduction of noise of automatic substations.

Members present at the two-day meeting were L. D. Bale, superintendent of power Cleveland Railway, chairman; W. E. Bryan, St. Louis; F. W. Peters, Schenectady; G. I. Wright, Chicago; W. C. Dixon representing C. A. Butcher, East Pittsburgh; T. Blommers, Pittsburgh; G. Solberg, Schenectady; F. R. Kelley, Pittsburgh; J. K. Keller, Pittsburgh; H. W. Codding, Newark, N. J.; C. L. Gerhardt representing G. W. Saathoff, New York; C. E. Bennett, Atlanta. O. Naet and O. K. Marti, American Brown Boveri Electric Corporation.

Arc Welding Processes

AT A meeting at association headquarters in New York City on April 9 special committee No. 6 of the way and structures committee discussed methods for utilizing arc welding for repairs to rails and to manganese steel. In 1925 a similar committee studied this question and also welding wire specifications. A set of rules was compiled representing what was thought to be the best modern practice. These rules were submitted at that time for information only.

This year it is proposed to continue the investigation. In connection with welding wire specifications the information obtained in 1925 showed that the only recognized standard specifications were those of the American Welding Society. It is planned to make a further study of the subject in an effort to secure data which will permit the committee to prepare a satisfactory specification for wire for railway track welding purposes. It was decided to work on the basis of five classes of welding steel: (1) Low carbon, not over six-hundredths of 1 per cent. (2) Low carbon, fifteen-hundredths to twenty-hundredths of 1 per cent. (3) High carbon. (4) Managanese. (5) Coated.

Those present at the meeting were A. L. Donnelly, H. H. Dartt, E. L. Lockman, R. B. Fehr and C. F. Gailor, chairman.

Special Reports Available

FOLLOWING is a list of special reports that have been prepared by the Bureau of Information and Service of the American Electric Railway Association and are available to member companies upon request:

Bulletin No. 73. Working Conditions of Electric Railway Trainmen. A tabulation showing the hours of labor, length and types of run, proportion of straight and swing runs, overtime rates, extra compensation allowed for special types of work, labor turnover, etc., for some 250 operating companies.

Bulletin No. 74. Electric Railways Operating Motor Bus Lines. A newly revised list of companies operating motor bus lines including some 325 companies and showing for each company the number of miles of bus route, number, type and seating capacity of buses, fare chart, transfer privileges, etc.

Bulletin No. 75. Relief from Paving Burdens. This is a supplement to Bulletin No. 52, issued Nov. 1, 1925. It contains a review of cases occurring since that time, in which street railways have been relieved of their paving burdens. It also contains a brief summary of cases now pending, in which application has been made for relief from paving operations.

In addition to the above, supplements to the Fare Bulletin, Wage Bulletin, Bus Wage Bulletin and Cost of Living Studies (Bulletin No. 76) have been prepared, bringing them down to date.

The News of the Industry

Increase in Pay for San Francisco Municipal Men Suggested

An increase in pay for trainmen of the San Francisco Municipal Railway, San Francisco, Cal., has been recommended by the Board of Supervisors. Final action on the matter is now up to the works board, which has already indicated its approval.

Under the resolution passed at a recent meeting of the supervisors an increase of 40 cents a day was recommended. The men had asked for 60 cents. This additional 20 cents has been promised the men as soon as funds become available.

The 40-cent increase will bring the men's pay up to $5.80 for an eight-hour day.

The Supervisors suggest a $2,000,000 bond issue to replenish funds that will be used up by the new pay scale. This money would be used for extensions and upkeep. It is also proposed to abolish the present depreciation fund, which now gets 18 per cent of the net annual revenues. In its stead it is proposed to create a 3 per cent depreciation fund, to be so designated that it can be used only for depreciation. Heretofore sums have been diverted from this fund for purposes other than those for which it was originally set up.

The resolution concerning the bond issue provides that $1,000,000 of bonds be sold at once to carry out the proposed program of extensions and that the second $1,000,000 be held practically as a depreciation fund asset to be sold when needed for purposes of a depreciation fund.

$1,450,000 Improvement Program for Dallas

The Dallas Railway, Dallas, Tex., has formally accepted the terms of an ordinance passed on April 7 by the City Commission. The new grant raises the cash fare from 6 cents to 7 cents and provides for the sale of five tokens for 30 cents. The half fare for children between five and twelve years of age remains at 3 cents, as does the half fare token issued to school students under seventeen years of age. The new fare ordinance requires that the company raise and expend $1,450,000 for replacements, improvements and extensions which are specified. Of this amount, $1,000,000 in new money must be raised and placed to the credit of the company before the ordinance becomes effective.

The Dallas Railway has been operating under a franchise granted on Jan. 8, 1917, wherein a 5-cent cash fare was stipulated. This franchise was later amended to permit the charge of a 6-cent cash fare for a limited period, conditional on the company's carrying out certain improvements and extensions named by the city. Three different fare extensions were made, all for limited periods and conditional upon carrying out certain stipulated improvements. The company found itself unable to make all the required improvements and extensions and keep its property up with a 6-cent fare and filed application for a 7-cent cash fare for an indeterminate period. The present fare adjustment is for an indeterminate period. It represents compromises proposed by the Supervisor of Public Utilities.

The final passage and acceptance of this ordinance ends a fare controversy which has been pending for several months.

Amendments to Cleveland Grant Pass First Reading

April 12 saw the City Council of Cleveland, Ohio, approve on first reading the so-called Horr transportation report. If this report is finally sanctioned the Tayler grant, under which the Cleveland Railway operates, will be modified to permit the company to obtain new capital and make service extensions. The amendments, which contain these provisions, will come up for final action on April 26 according to the present program.

After much discussion the City Council defeated by a vote of eighteen to six amendments proposed by the street car union. The union had attempted to have included in the new railway franchise clauses which would recognize the American Federation of Labor and provide for arbitration of wages and disputes over matters of discipline. John J. Stanley, president of the Cleveland Railway, had emphatically declared that the company would reject any such amendments.

At a meeting of the street railway committee before the general session of the Council 150 motormen and conductors, a few with their children, packed the committee rooms. A sergeant and a squad of police were detailed to prevent any possible trouble.

At this meeting platform men appeared for the first time to heckle union leaders and urge passage of the Horr amendments and acceptance by the union of President Stanley's offer of a 5-cent-an-hour increase in wages. Mr. Stanley presented 380 new names on petitions asking passage of the Horr amendments. He presented 1,482 names the week before. Some men who spoke against the union leaders charged the union heads with playing the "same old game, year after year," and being responsible for the men being "hornswoggled" out of the 15-cent increase last year in the courts.

City Law Director Carl F. Shuler and his assistant, Alfred Clum, expressed the opinion that the union amendments in the present form were illegal.

Thirty-Year Control Bill for Boston Killed

The bill to extend the public control of the Boston Elevated Railway, Boston, Mass., for a period of 30 years was killed in the Massachusetts Legislature on April 14 by an overwhelming vote. There will be no further legislation this year affecting the financing or control of the Boston property.

At the first voting the bill scored a victory with the committee on metropolitan affairs and committee on street railways sitting jointly. The trustees of the railway were in favor of the Boston control bill. Recently, H. Ware Barnum, general counsel for the Board of Public Trustees, said that such an extension was necessary to economic financing as it gave an element of certainty to the investment. The Chamber of Commerce was of the opinion that it was for the best interest of the car riders and the community that public control of the Elevated should be maintained for at least 30 years more as this would pave the way to obtain capital and permit service to be improved.

Denies Motion to Dismiss Utica Fare Case

Chairman William A. Prendergast of the New York Public Service Commission denied on April 14 the motion of Corporation Counsel Clarence E. Williams of Utica to dismiss the petition of the New York State Railways for permission to increase fares in the Utica zone to a 10-cent cash fare and 7½-cent ticket fare.

Chairman Prendergast said that if the petition were dismissed the company would not be disqualified from filing a new petition immediately, and that in view of the completed examinations of the company's books by the commission's accountants and a spot check of the company's inventory by the commission's engineers now under way, it would be better to proceed to a conclusion of the case. Mr. Williams based his motion to dismiss the proceeding on the claim that the inventory and appraisal of the company's property submitted by H. C. Throop was not reliable, and that if a rate base is to be fixed it should be on the basis of a definite inventory, reliable and up to date. He further argued that the company had not taken into consideration any depreciation of its property. The accountant of the Public Service Commission who has had charge of the examination of the company's books presented his report, which showed a reduction of $52,000 in the gross income in four years from 1921 to 1925 over that set forth by the company, adding that much to the deficit claimed by the company.

Dispute in Los Angeles Over Tunnel Use

A lively public discussion with an element of local politics injected has existed in Los Angeles, Cal., over a proposed rerouting of some of the street cars to the north section which involves the use of the North Broadway tunnel by the Los Angeles Railway.

Preparations for the construction of a new city hall as part of a civic center group on Spring Street would make operation of street cars through this section of Spring Street impossible. Main Street is used for street car operation, but as it would be practically impossible to route all north and southbound cars on the one street, the city officials proposed that car tracks be laid through the North Broadway tunnel. At the request of the city, the Los Angeles Railway applied for a temporary permit to lay such tracks and operate cars through the tunnel. The permit was granted and work started.

An application for a court injunction to prohibit the laying of tracks was filed by John W. Arnold, citizen and taxpayer, whose son, John E. Arnold, was a defeated candidate for election to the City Council at the last election. Before the injunction suit came to trial the construction of tracks had been practically completed.

Later, a suit was filed in intervention in the Arnold suit by Miss Madeline F. Wills asking for a permanent injunction restraining the railway from using the tunnel and a permanent injunction restraining the City Council from granting franchises to the street railway permitting tracks through the tunnel. City and Council officials have been in conference on a division of cost on the work, which is estimated at $550,000. The last move to straighten out the tangle was taken by the City Council when it filed a suit to quiet title to the Broadway tunnel property so that the city will have undisputed right to the land.

Bonding Plan at Detroit Disapproved

Some way will be found to purchase the new buses and cars needed by the Detroit Municipal Railway, Detroit, Mich., but the Detroit City Council has refused to grant the request of the Municipal Department of Street Railways for a $4,000,000 bond issue to be included in the new budget. It was intended that this sum should cover the purchase of 125 double-deck gas-electric buses and 150 street cars.

The Street Railway Commission based its request upon the recommendation of General Manager H. U. Wallace that $4,000,000 be supplied by a bond issue, to be augmented by $70,000 which the department was to furnish. This would have enabled the purchase of the needed equipment for cash at a saving of more than $379,000 compared with the terms offered by the manufacturers in their proposals to furnish the equipment on the seven-year payment plan.

It was explained by Councilmen in refusing to grant the request that because of the 7 per cent bonding limit in Detroit it had become necessary to raise by taxation $3,000,000 which ordinarily would have been obtained through bond issues. The Council expressed a favorable attitude toward public utility bonds or mortgage bonds and practically agreed to submit the necessary proposition to the people. Some of the Councilmen favored the time-payment plan.

At the meeting at which the equipment matter was discussed the Miller-Shorn plan of rapid transit on surface lines on Jefferson Avenue was taken up with reference to cutting down the number of street cars and adding buses. The additional street cars asked for by the D. S. R. are needed on other city lines and it is estimated that about 575 street cars now in use will have to be scrapped within a few years. Mr. Wallace expressed the opinion that sufficient service could not be given to the people of Detroit without the purchase of the 125 coaches and 150 street cars.

Governor Approves Acts on New York Transit Laws

Governor Smith of New York, on April 15, signed the reorganization bill under which the Transit Commission becomes the Metropolitan Division of the Public Service Commission and the terms of commissioners are made nine years. The terms of Transit Commissioners Harkness, McAneny and O'Ryan have now expired, but the Governor deferred appointment of their successors.

Wage Demands Presented by New York State Men

Demands for a new working and wage agreement for the year beginning May 1 have been sent to James F. Hamilton, president of the New York State Railways, by the union employees of Rochester, Syracuse and Utica. It is certain that the employees have asked for a wage increase, but the amount is not revealed. The railway is to ask for a renewal of the present contract.

It is likely that the Rochester men will demand a settlement independent of the unions of the two other cities. A fare increase granted in the Kodak City is the main basis on which the Rochester men make their appeal for a pay boost. The railway has applications before the Public Service Commission in Utica and Syracuse for a like fare advance, but it is not probable that action will be taken before May 1.

Gasoline Tax Bills in New York Probably Lost

All of the gasoline tax bills introduced in the Legislature have been sent to the rules committee, which has assumed charge of legislative steering in the Senate and Assembly. The bills are believed to be dead for this year. Milan E. Goodrich, the father of the gasoline tax measure of two years ago and introducer of one of the five bills of this year, has not given up hope that the Assembly rules committee may report out his bill before adjournment, but opinion seems to be that the rules committee will not take any chance with the measure.

South Americans Study U. S. Industry and Highways

Publishers and editors from Central and South America, Mexico and the West Indies arrived in Washington on April 7, where they met a similar group of representatives of the press from every part of the United States at the first Pan-American Congress of Journalists.

Following the Washington sessions of the congress, which terminated April 13, the 100 or more Latin American editors started on a tour by bus of the eastern and central parts of the United States. On this tour many of the great industrial plants of the country will be visited and an inspection made of highway development.

The gathering is considered the most important journalistic conference ever held in the New World. Twenty-one republics are represented. Welcomed by President Coolidge and addressed, among others, by Herbert Hoover, the congress organized the Pan-American Association of Journalists to perpetuate the movement toward international understanding through the press initiated at the present gathering.

The men in attendance at the session discussed the part of the press in maintaining understanding among the American nations and considered the various problems of newsgathering, advertising and editorial policy common to all journalistic enterprises.

Every facility is being provided on the bus tour to present to the visitors a manifestation of the warm sentiment existing here toward the other republics of the Western Hemisphere. The expenses have been met by citizens of the United States desirous of fostering good will and trade relations with Latin America. The trip will be in two parts. The first part, from April 14 to 22, includes a visit in the South, together with a five-day stop in New York City. The second part will include a tour west to Ohio and possibly Chicago.

Detroit's Right to Regulate Jitneys and Buses Confirmed

The Michigan Supreme Court has reversed the decision of the Wayne County Circuit Court and upheld the validity of the Detroit ordinance regulating jitney bus traffic on Detroit streets. The court ruled that the legislative department of the city of Detroit has determined that the ordinance is for the public's welfare and for the public good, and the ordinance was declared valid on these grounds. The Corporation Counsel's office will draw a reasonable ordinance regulating all public conveyances operating on the streets of Detroit, including jitneys, buses and taxis. The effect of the decision will be to give Detroit absolute control over its streets.

Cummins Bill Tabled

With the assurance that the Cummins bill (S. 1734) designed to regulate interstate bus operation will not be reported out of committee for the Senate's consideration, the prediction is made by Washington observers that no legislation of this nature will be passed during the present session of Congress.

East Oakland Transportation Again Up for Discussion

The California Railroad Commission has taken under advisement a proposition by the city of Oakland to have the Southern Pacific give local transportation facilities to territory in East Oakland. It is desired to have the company complete a loop from the heart of the business section connecting with a line that runs from the Mole on the bay into East Oakland territory. The plan was first instituted in 1921, but hearing was delayed by mutual agreement until now.

J. E. Warren, chief of the passenger rate department of the Southern Pacific, who was a witness, said that the Key System was in the street car business and that the Southern Pacific was willing to let it handle all the East Bay local traffic. His company did not want to develop any local service unless it could be assured beforehand that it might expect a reasonable return on the investment. From surveys made he said the company felt that additional service such as was desired would be a net loss. Mr. Warren declared that there had been a marked decrease in patronage on the line into East Oakland in the last five years. He attributed this, in part, to the Key bus service. It was also pointed out at the hearing that the Key system now has an application before the commission for permission to operate a bus line between Oakland and Hayward, and that this service, if authorized, would do much to improve East Oakland transportation. Commissioner Decoto proposed that the two companies study interchange of transfers.

Seeks Higher Fare in Rome

The New York State Railways applied to the Public Service Commission on April 12 for authority to establish a new maximum rate of fare of at least three tickets for 25 cents and a cash fare of 10 cents in Rome in place of the 7-cent fare, which has been in existence since May 25, 1920. The company alleges that the 7-cent fare in Rome was authorized in 1920 upon condition of the company undertaking and completing certain improvements to its property in that city. These conditions, it alleges, were complied with at great expense. The company claims that at no time since the 7-cent fare was established has its earnings met the cost of operation in the city of Rome and that it is not now earning the same. The net operating deficit in 1925 was $6,914. The company claims that there is no reasonable ground upon which to base the hope or expectation that the Rome lines can be operated without a similar deficit in the future, and if service is to be continued in Rome the petition states that it is imperative relief be afforded by increased fare.

Ejecting Passengers Scored by Winnipeg Company

The Winnipeg Electric Railway, Winnipeg, Manitoba, Canada, recently sent to its motormen and conductors a bulletin which read as follows:

> A child of tender years, a person of unsound mind, or a person in such a feeble or helpless condition as to be unable to take care of himself must not be ejected. If you are in doubt make no attempt to eject a passenger.

The company assures its employees that in this as in all other cases it is expected employees use their best judgment in the application of the rules laid down by the company.

Billboard Campaign at Providence

Two series of billboard posters were used by the United Electric Railways, Providence, R. I., at 48 locations in a campaign that extended from Jan. 12 to March 12. Eight of these were illuminated at night. The ads were placed on main highways leading in and out of Providence, where the heaviest private automobile traffic was known to exist. One of the most striking of the ads was located at the Providence end of Washington Bridge, where all auto traffic coming in to Providence from the East concentrates. Two others were placed on Broad Street, one of the busiest thoroughfares in the city, and two on the road to Narragansett at a point where an average of 2,000 cars an hour pass. Others were placed near manufacturing plants to call the attention of the workers using private autos to the advantages of going to and from work by trolley.

Since the first of the year, riding on the trolley lines has increased materially and consistently and the poster campaign is credited by railway officials with stimulating a portion, at least, of this increase.

Eight-Cent Railway and Bus Fare Sought for Pasadena

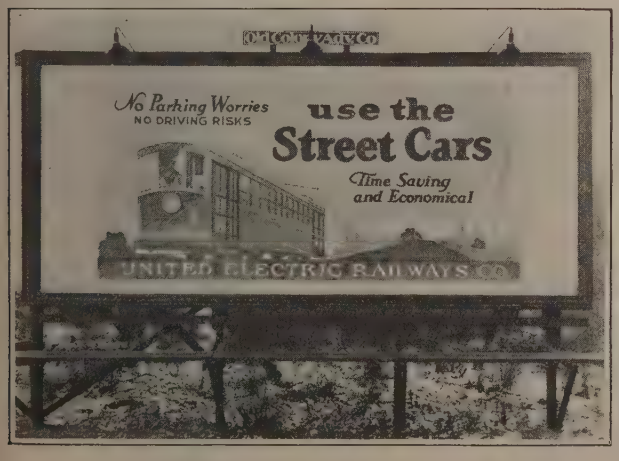
The California Railroad Commission recently took under consideration the application of the Pacific Electric Railway for an increase in railway and bus fares in the city of Pasadena, Cal., from 6 cents to 8 cents. At a former hearing the company was denied its 2-cent increase on the grounds that the commission lacked jurisdiction to rule on buses. Later a rehearing was granted and at this recent meeting Frank Karr, chief counsel and vice-president of the Pacific Electric Railway, argued that under the law creating the State Railroad Commission, a rate-fixing body of common carriers, it had control of buses.

The city of Pasadena will resist an increase in local street car and bus rates on the ground that the company can obtain a fair return on its investment by changes being made in the operation and routes of the buses. Those who have made a study of the local transportation system claim that the bus lines could be put on a paying basis if the routes were further apart. In Pasadena the routes are spaced one-quarter of a mile apart. It is said that although the buses show a deficit in Pasadena, the railway lines of the Pacific Electric are making money.

City Attorney Howard said that the city was not opposing commission jurisdiction, but that if the commission should assume jurisdiction over the buses the city would suggest the appointment of a committee to change and modify the Pasadena bus system.

Amalgamated Wants Certain Clauses in St. Louis Franchise

The Amalgamated Association hopes to have the new railway franchise for St. Louis, Mo., include a provision against the use of one-man cars. A bill providing against such cars was defeated at the last session of the Missouri Legislature. The carmen hope to include in the franchise a clause recognizing the right of the employees to organize. They want a form of franchise now in effect in Montreal, Canada, also a clause providing for compulsory arbitration of disputes over wages or working conditions, taking in the ideas expressed in the Watson-Parker bill now pending before the United States Senate.



Indifferent Indeed Would Be the Person Who Did Not React Favorably to These Billboard Messages

Ten Cents Sought in Oneida

The New York State Railways on April 12 made application to the Public Service Commission for authority to establish a new rate of fare of at least three tickets for 25 cents and charge a 10-cent cash fare on its lines in the city of Oneida in place of the 7-cent fare which the company has been collecting since Feb. 7, 1923.

The company alleges that at no time since the increase to 7 cents has it earned its actual cost of operation. It further alleges that in 1923, 1924 and 1925 the net operating deficits ranged from $9,065 to $28,836, and that the actual gross loss ranged from $15,413 to $35,740. The company further alleges that in view of the long period of time during which the deficit has continued there is no reasonable ground upon which to base the hope that the lines in the city of Oneida can be operated without a similar or increased deficit in the future. It is therefore imperative, it claims, that relief be afforded in the form of an increased rate of fare.

Change in Ticket Collecting Method at Portland, Me.

The system of fare collection on the lines of the Cumberland County Power & Light Company, Portland, Me., will be changed on June 1. There will be no change in the amount of fare, but an alteration in type of tickets and in the kind of fare boxes used for their collection. Instead of the present ticket, which requires punching, strip tickets will be sold for the same price as the present tickets—40 cents. These strips will contain five tickets each, and when the fare is paid a ticket will be torn off and deposited in the new fare box, which is so arranged that it can take care of ticket as well as cash fares.

The object of the change is to facilitate the handling of fares and prevent the congestion that frequently results at the present time, particularly on the one-man cars, when an operator is required to punch several tickets in succession, and possibly also to stop and make change.

The company has purchased 120 Cleveland fare boxes to re-equip the system.

Storm Affects "Radial" Railways in Ontario

A severe storm swept over the Province of Ontario, Canada, on March 31 and April 1, damaging the hydro system and various electrical utilities in Toronto and a number of other centers. The damage to the provincial hydro system was estimated between $35,000 and $40,000. The "radial" railways in Toronto also were damaged. The Metropolitan, serving a thickly populated district, was the hardest hit when the collapse of a 12,000-volt line cut the service for many hours. In Weston, a suburb of Toronto, factories were obliged to close for three days through the disruption of the hydro service. Telephone and telegraph systems suffered a complete paralysis. Manufacturing plants closed down in Brantford, Guelph, Woodstock and Galt.

News Notes

Service Between Hartford and Springfield.—The Hartford & Springfield Street Railway, Warehouse Point, Conn., which is planning reorganization through a sale of its property during April, received an additional blow to its plans when the New England Transportation Company, bus subsidiary of the New Haven road, announced a bus service, effective April 18, between Hartford, Conn., and Springfield, Mass. The new service will run express exclusively between the two cities. Coaches of the 27-passenger type will be used, four of which will run regularly and two during rush periods or on other special occasions. The route will be along the east side of the Connecticut River. In the establishment of this new line is foreseen a natural tendency to draw all through fares from the Hartford & Springfield's bus route.

Proceedings Halted to Honor Mr. Maltbie.—The memory of William H. Maltbie, valuation counsel for the United Railways & Electric Company, Baltimore, and a member of Mayor Howard W. Jackson's Efficiency and Economy Commission, was honored before the Maryland Public Service Commission on April 9. Mr. Maltbie died several weeks ago. The memorial services were held following a hearing in which the United was interested. At the services lawyers for the company, including Edwin G. Baetjer; Clarence W. Miles, people's counsel, and the members of the commission spoke.

Temporary Fare Cut to Beaches.—D. W. Pontius, vice-president and general manager of the Pacific Electric Railway, Los Angeles, Cal., has announced a temporary summer special 50-cent excursion over the lines of the company to near-by beach resorts. The round-trip fare of 70 cents will be reduced to 50 cents and will continue in effect for several Sundays in order to determine the volume of business that may be developed by reason of the reduced fare. Special excursion fare tickets will be good for use only on the Sunday purchased. Whether the fare will apply throughout the summer depends on its providing sufficiently attractive to develop the traffic necessary to make it remunerative.

Pamphlet Tells of Stock Sale.—How the Philadelphia Rapid Transit Company, Philadelphia, Pa., secured applications from 50,000 car riders and employees for more than 20,000 shares of 7 per cent cumulative preferred stock is told in "A Million a Day for Ten Days," a twelve-page pamphlet with illustrations of the advertisements used in this campaign. The extent of the publicity used in the campaign is noted in the booklet where "ads" run in foreign language newspapers are reproduced. Car signs displayed on the dash, in subway stations and on buses are also reproduced. An account of the plan and methods employed in the stock-selling campaign was published in the ELECTRIC RAILWAY JOURNAL, issue of March 13, page 437.

Under Georgia Jurisdiction — The transfer of the Augusta-Aiken Railway & Electric Corporation from a South Carolina to a Georgia organization has been approved by the Secretary of State. The company operating a railway system between Augusta, Ga., and Aiken, S. C., has been functioning under a South Carolina charter since 1906. It is capitalized at $4,500,000.

Parley on Wage Agreement.—Negotiations are under way between the Memphis Street Railway, Memphis, Tenn., and the trainmen's union. The men are seeking an increase of 12 cents an hour over the present scale, which would fix the new scale at 57 cents for the first-year men, 62 cents for the second-year men and 67 cents for the men who have been in service for more than two years.

New Fare Hearing Allowed. — The Wheeling Traction Company, Wheeling, W. Va., has been granted a rehearing on its petition for a change in rates, according to A. C. Spurr, general manager of the company. The company seeks to sell nine tickets for 50 cents instead of ten tickets as at present. Mr. Spurr further stated that the petition had once been denied by the commission following a hearing. The change sought by the company for its lines on the West Virginia side of the river is now in effect in Ohio as the Public Utilities Commission of that state granted a similar petition some time ago.

Improvement in Worcester Service Planned.—The Worcester Consolidated Street Railway has announced a radical change in the operation of one-man cars in Worcester, Mass. Beginning April 20 it is planned to use one-man cars on all lines from 4:39 a.m. to 11 a.m. and after 8 p.m. The company anticipates an improved service under this plan. As an illustration of this the proposed new schedule provides for a 3½-minute headway between the City Hall and Webster Square.

Power Situation in Holyoke Adjusted.—The Massachusetts Department of Public Utilities has dismissed without prejudice the petition of the Turners Falls Power & Electric Company for permission to establish connections with the Berkshire Street station of the Holyoke Street Railway, in Holyoke, as a result of a settlement of the controversy between the Turners Falls company and the Holyoke Water Power Company. The petition asked for the right to take by eminent domain land necessary for a transmission line between Chicopee and the street railway power house. Contracts have since been executed providing that the railway shall receive energy from the Turners Falls company through sale to the Holyoke Water Power Company and resale by it. It was more than a year since the original hearing was given by the commission in Holyoke on the petition. At that time, the Turners Falls company's purpose was firmly opposed by the Holyoke Water Power Company on the ground that entrance to the city by the competing company would threaten the Holyoke company's status with manufacturing concerns that are large purchasers of energy. Hitherto efforts to bring the three companies to an agreement had failed.

Recent Bus Developments

De Luxe Service by Public Service in New Jersey

Forest Hill, originally selected by the Public Service Transportation Company, Newark, N. J., to be among the first sections favored with de luxe buses, will have a line of this kind soon. At the same time a similar line will be started between Newark and Plainfield, if the plans of the company are successful.

Applications for municipal permits for the Plainfield line have been made to the municipalities through which the line will operate, with the exception of Newark. The Newark application will be made within a few days.

Eleven buses of the gasoline-electric drive type have been ordered for use on the two lines. Of these, six will be placed in the Newark-Plainfield service and five on the Forest Hill line. The bodies of the Newark-Plainfield buses will be of the de luxe type used on interstate lines and will have 27 seats upholstered in leather. No more than a seated load will be carried. The bodies of the Forest Hill line will be similar to the type ordered for general service but with leather upholstered seats.

The Newark-Plainfield route will be through Irvington, Union Township, Roselle, Cranford, Garwood, Westfield, Fanwood to Plainfield, a distance of 20 miles, with a scheduled running time of about one hour. The buses will give express service between the Newark terminus at the tube station to Union Township, no Irvington passengers being carried, running on a half-hourly schedule from 7:30 a.m. until after the close of the evening performances of Newark theaters. The through one-way fare has been fixed at 75 cents; intermediate fares will be in proportion, with a 10-cent minimum.

The Forest Hill line will serve local needs only. The one-way distance will be about 4 miles at a 10-cent fare.

The equipment and service are designed for shoppers, theatergoers and others who desire special comforts and conveniences. The Newark-Plainfield and Forest Hill lines will be followed by others if the approval of the public authorities is obtained.

Non-Stop Service Between Detroit and Toledo

Non-stop bus service between Detroit and Toledo was started on April 3 by the Detroit-Toledo Transportation Company, a subsidiary of the Detroit United Railway, operated under A. L. Drum, executive manager for the receivers of the railway. The buses start from the Detroit Bus Terminal at 158 Bagley Avenue. They make the non-stop run of more than 60 miles to Toledo in two hours and fifteen minutes. The buses carry only through passengers between Detroit and Toledo.

Except on Saturdays, the buses leave at 9:10 a.m. and 1:10 and 5:10 p.m., making three trips a day. On Saturdays and Sundays two additional buses are operated, starting from the terminals at 8:10 and 10:10 a.m.

The buses are named the Royal Blue Goose Fliers. They are Yellow Coach equipment, painted a royal blue with vermillion roof and hood and ivory colored window frames. The interiors are finished in white enamel, with staggered individual seats.

Sightseeing Services to New York Restrained

Supreme Court Justice George H. Taylor, Jr., of Mount Vernon, N. Y., has issued a temporary injunction against the New Rochelle Sightseeing Company restraining it from operating bus service from New Rochelle to Times Square, New York City. The injunction was obtained by the Westchester Electric Railroad. Two other companies are operating bus lines from New Rochelle to Times Square, but they were not specifically named in the injunction. The railway contended that it had franchises to operate over the routes on which the bus companies were operating. Justice Taylor has not given a decision on the application of the Third Avenue Railway for a permanent injunction against the Mount Vernon Sightseeing Company, which operates a bus line from that city to Times Square. Arguments on this application were heard on April 7 after a temporary injunction had been granted. The railroad said it was not legal for the buses to operate because necessity for a franchise had not been recognized by the commission.

New Bus Regulations in British Columbia

Speed, weight of cars, schedules and other details connected with the operation of buses will be the subject of regulations announced by the government of the province of British Columbia, Canada, as going into effect during the next few weeks. The proposed regulations set out in minute detail the gross weight, including weight of vehicle and its load, which may be hauled on any class of load on either of the two road seasons, winter or summer. All bus lines will have to file schedules of their operations with the Minister of Public Works, and if these schedules are approved must operate buses strictly in accordance with them. The speed of buses will be restricted to the average speed provided in the schedules. In addition, operators will have to furnish security in the form of a bond or policy of guarantee from an approved insurance company, covering possible accidents. The operator's liability is limited to $1,000 in respect of a single person and $5,000 in respect of all persons injured in a single accident. Buses must stop not more than 20 ft. away from any level railway crossing before traversing it.

Paving Question Raised in Kansas City

Advent of the bus system of the Kansas City Railways, Kansas City, Mo., has brought up the question among property owners as to who shall pay the expense incurred in repaving and repairing the streets over which the railway's buses are operated.

In the case of Warwick Boulevard, the City Council had arranged to have the street repaved at the expense of the property owners, but the plan has been meeting with not a little opposition.

In a recent "Speaking the Public Mind" column of the Kansas City *Star* one of the property owners contended that the brunt of the expense of repaving should not, in any event, fall upon the property owners. He did not demand that the Kansas City Railways be made to pay the amount expended, but he contended that some one other than the property owners should pay it. Since he credited the bus service with being responsible for much of the need of repaving and repairing the city streets, it was asked that the railway be assessed at least a portion of the expenses, or that the gasoline tax paid by that company be set aside as a sinking fund to care for future unavoidable expense.

Buses Win Temporarily in Beech Grove

After an absence of several weeks buses again are operating through the main thoroughfare of Beech Grove, Ind. The seesaw fight in which the town board of Beech Grove, the Beech Grove Traction Company and the South Side Motor Coach Company were involved finally resulted in a victory for the buses on March 17 when the Superior Court granted a temporary injunction preventing the board from enforcing the town's bus ordinances. One ordinance keeps the buses from the principal street or any street within one square of this street. The other prescribes a route for buses. A motion for a new trial, presented by attorneys for the town board, was overruled by the court. Attorneys then said an appeal would be taken.

The skirmish started last fall when the town board enacted its first regulatory ordinance. Officials of the bus company attacked the ordinance and carried their fight into the Marion County courts. Restraining orders were obtained against enforcement of the ordinance. On final hearing the restraining order was dissolved.

The buses then were operated over a new route. The board several weeks ago enacted a new ordinance, permitting the buses to use only certain streets. This route prohibited the buses from running to their station. A restraining order prohibiting enforcement of the ordinance was obtained by the operators. Judge Miller's recent action had the effect of dissolving the orders.

Citizens of Beech Grove were said to have assured Frederick Schmidt, who purchased the Beech Grove Traction Company at receiver's sale in Circuit Court, that he would have no competition from buses. The bus line was proposed after the sale was made.

Franchise Awards in New York Expected by May 1

Joseph V. McKee, acting Mayor of New York City and chairman of the sub-committee appointed by Mayor Walker to arrange the terms for the bus franchises for which applications have been made by several companies, reports the work of that committee practically completed. The fundamental terms of the franchises have been gone over and the committee will make its report to the Board of Estimate and Apportionment within a few days. The Board of Estimate will then grant franchises to those companies or company which in its opinion appear to offer the best terms and give evidence of ability to carry the franchises. The franchises will probably be granted by May 1. In the event that this is so, the first of the buses to be run under the new arrangement will probably be in operation by July 1.

More Buses for Worcester.—The license board at Worcester, Mass., has granted the Worcester Consolidated Street Railway permits for two additional buses to Marlboro and one to Southbridge.

Bus Line to Replace Rail Line.—The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., will replace railway service with bus service on its Wanderer's Rest Cemetery branch of the Walnut Street line. This is to provide more frequent service during rush-hour periods. The bus line will be included in the single city fare zone with full transfer privileges.

Route Book Ready.—A new bus route book has been issued by the Los Angeles Railway, Los Angeles, Cal., for the convenience of patrons. Copies may be obtained by writing or calling at the office of the traffic department, 1050 South Broadway, Los Angeles, Cal.

More Buses for Use in San Francisco.—The Market Street Railway, San Francisco, Cal., has started its first bus line. The new line is located in the Mission district. Three buses are being operated on a ten-minute schedule. The buses are of the latest safety coach type, and each accommodates 30 passengers. The Municipal Railway has several bus lines in San Francisco, but this is the first venture of the Market Street line into that field.

A Slogan Sought for Bus Riding.—A contest has been started by the Wisconsin Power & Light Company among its 150 Fond du Lac employees to secure a new name or slogan for use on its city and interurban buses. The slogan to be selected must not be longer than four words, which will be painted on all cars and buses operating in this territory.

Buses to Replace Remaining Lines in Salem.—T. E. Billingsley, superintendent of the street railway lines in Salem, Ore., has applied to the City Council for authority to replace the cars with buses on the South Salem-Fair Grounds route. Buses have already been substituted on the Seventeenth Street and Yew Park lines. The railway lines in Salem were included in the Southern Pacific system.

Financial and Corporate

$65,000,000 Associated Electric Financing

Offering was made on April 6 of $65,000,000 Associated Electric Company 5½ per cent convertible debentures, due 1946. The bonds were priced at 95½, to yield over 5.90 per cent to maturity. The new issue is convertible into the $6 dividend series preferred stock of the Associated Gas & Electric Company at the rate of eleven shares for each $1,000 bond.

Thirty different issues of securities carrying interest or dividends at rates varying from 6 per cent to 8 per cent are to be retired through this financing. Security holders in all parts of the country will be affected, not only by the call of high interest bearing obligations but by reason of the fact that the new financing will furnish Associated Gas & Electric system with what is termed a sound and conservative vehicle for financing its future requirements. The position of stockholders and other junior security holders of Associated Gas & Electric Company, of which the Associated Electric Company is now the largest and most important subsidiary, is being materially improved through this financing, according to the bankers.

Practically the entire proceeds of the $65,000,000 of bonds to be sold tomorrow will go toward paying off underlying bond issues, preferred stocks, notes and bank loans, so that the interest charges of the Associated Gas & Electric Company will be somewhat less after the transaction than before, owing to the fact that many of the underlying bonds, preferred stocks and notes to be retired bear higher interest rates than the new bonds to be issued.

The offering syndicate was headed by Harris, Forbes & Company. It was announced that C. W. Beall and F. S. Burroughs of Harris, Forbes & Company will become directors of the Associated Gas & Electric Company.

Improvement in Earnings and Traffic in Springfield

Business of the transportation department of the Illinois Power Company, Springfield, Ill., both in earnings and in the number of revenue passengers carried, increased in 1925. This statement was contained in the report to the stockholders. Railway earnings totaled $708,984, against $691,386 for the year previous. The number of revenue passengers carried was 11,286,894, a total that exceeded either of the preceding two years and is an increase of 625,443 over 1924. This recovery is worthy of note, says the report, "especially in view of the fact that the management accomplished this result, provided an enlarged service, continued the development of a unified street railway and bus system and carried forward its program of track and paving improvements in the face of rising costs of operation and maintenance and a need for an increased fare."

The company expended $141,183 for additions and improvements to the transportation department. Two new bus routes were established and three new 29-passenger buses were purchased and placed in service.

$1,700,000 Equipment Trust Issue

Application has been made to the California Railroad Commission by the Key System Transit Company, Oakland, for permission to market $1,700,000, par value, of equipment trust certificates to supply funds to purchase two new turbo-electric ferryboats and 40 steel cars.

The boats are at present under construction in the Moore shipyards; eight of the cars have been delivered, three are en route from St. Louis and 29 others are being built.

According to C. C. Vargas, comptroller of the Key System, the certificates will bear interest at the rate of 5½ per cent and will be retired serially, the first $175,000 being redeemable three years after issuance. The remainder will be redeemed at the rate of $112,000 annually.

The new equipment to be secured by the certificates is valued at $2,153,561. A favorable decision by the Railroad Commission is regarded as likely in a few days.

Baltimore Valuation Confirmed

Acting on a protest filed recently by the United Railways & Electric Company, Baltimore, the Maryland Public Service Commission has handed down an order in which its valuation of $77,000,000 on the company's property is ratified, confirmed and made final. The commission recently fixed this valuation after a long series of hearings. In the total amount an item of $7,000,000 was allowed on the value of easements. This was protested by Clarence W. Miles, people's counsel, who has taken the question into the courts. Following Mr. Miles' action, the United filed a protest with the commission, charging the valuation on its property as fixed by the commission was too low. It was on this protest that the commission took its most recent action. Four items in the valuation were disputed.

Further Steps in Reorganization of Dayton Property

The Ohio Public Utilities Commission, by order entered March 31, 1926, authorized the Cincinnati, Hamilton & Dayton Railway to acquire the railway property of the Cincinnati & Dayton Traction Company and to issue to Thomas Conway, Jr., Warren S. Hayden and Livingston E. Jones, reorganization managers, in exchange for said property, $200,000 bonds secured by a first mortgage on the local rail-

way lines in the city of Hamilton, Ohio; $250,000 first and refunding mortgage bonds secured by a lien on the entire property, and 59,500 shares of common stock without par value. In addition thereto the commission authorized the issue and sale of 500.000 shares of common stock without par value for cash and the extension of an underlying mortgage aggregating $200,000 covering part of the interurban line.

The foregoing steps have been taken in furtherance of the plan of reorganization of said property summarized in the ELECTRIC RAILWAY JOURNAL, issue of March 13, 1926, page 464.

Phoenix to Do Some Financing Soon

Following the submission of the report of the investigating committee, consisting of J. M. Richardson and A. B. Clements, recently appointed by Mayor Jefferson of Phoenix, Ariz., to make a survey of the local transit situation, it is now planned to hold a bond election to provide funds necessary for rehabilitation of the Municipal Railway property. City Manager Henry Rieger explained to the City Commission on March 31 that the plans for a special election to consider the voting of bonds would be completed within a week from that date and that the election itself would probably be set for some time in May. The amount of bonds to be issued will probably be $500,000.

Hull Electric Company Under New Control

The International Pulp & Paper Company, New York, has purchased the Hull Electric Railway and the Hull Electric Company, Hull, Que. The purchase includes the water power development at Deschenes Rapids on the Ottawa River above Hull, as well as a power development of the Hull Electric Company at Paugan Falls on the Gatineau River.

Bus Company Meets New Jersey Board's Stock Idea

The Delaware & New Jersey Transportation Company, which is to operate five bus lines in southern New Jersey and Delaware, was authorized on April 13 by the Board of Public Utility Commissioners to issue 5,000 shares of common stock and 2,400 shares of preferred stock at $100 a share.

The application of the concern was contained in an amended petition filed after the board refused to approve a prior request on the ground that the sanction sought would create a voting trust with control in a few stockholders' hands. At that time the company asked permission to issue $200,000 of non-voting preferred stock, 2,000 shares of non-voting common stock and 2,500 shares of voting common stock.

In granting approval of the amended application the board assigned a value of $50,000 to the common stock.

The decision is of interest because of the attitude taken by the commission on the matter of non-voting stock when the question first came before it. The ruling was made the subject of an editorial in the ELECTRIC RAILWAY JOURNAL for April 10.

Balance in Pittsburgh $52,131

Many Improvements Effected in 1925 on Lines Carrying 320,968,755 Passengers—Pittsburgh Motor Coach Company Reports Surplus

Final results of operations of the Pittsburgh Railways, Pittsburgh, Pa., for the year ended Dec. 31, 1925, leave a balance of $52,131 after provision for the agreed return on investment, cost of new money, liquidation of one-tenth of certain obligations assumed upon termination of receivership and payments to municipalities according to the terms of the respective agreements. This statement was made in the annual report of the Philadelphia Company, the parent company, to the stockholders. The gross revenues decreased $250,000 compared with the preceding year. After providing $2,075,000 for depreciation reserve, operating expenses and taxes were reduced $567,742, resulting in a gain of $282,942 in net earnings.

The effect of the weekly pass and other methods of stimulating the use of the street cars is reflected in the estimated number of car rides of more than 370,000,000 against the revenue passengers carried of 269,000,000, which includes transfers and the equivalent revenue rides per pass. The weekly pass and other special inducements to attract patronage have increased the volume of business and have made available to the regular car rider a lower fare. The result should be that without any noticeable increase in the expenses the additional rides which justify the purchase of the weekly pass can be taken care of. Furthermore, there is an incentive for many car riders to use the street cars during the day or in the evening, when otherwise they might not do so.

During the year 5.86 miles of track was added to the system and 2.06 miles abandoned, giving a net increase of 3.8 miles of single track. In addition, 26.06 miles of track was reconstructed, a program which is being closely followed in the work of rehabilitation planned well in advance.

The company has effected a number

SUMMARY OF INCOME OF THE PITTSBURGH RAILWAYS FOR THE YEAR ENDED DEC. 31, 1925

(Prepared in accordance with the terms of the agreement between city of Pittsburgh, sundry other municipalities, Philadelphia Company and Pittsburgh Railways.)

Gross revenue from street railway operations		$21,813,696
Operating expenses:		
Maintenance of way and structures	$2,492,696	
Maintenance of equipment	2,235,267	
Traffic	204,489	
Power	2,005,651	
Transportation	7,263,545	
General	913,405	
Miscellaneous	1,731,978	
Taxes	614,142	
Total		$17,461,176
Net revenue from street railway operations		$4,352,519
Auxiliary operations:		
Operating revenues	$176,007	
Operating expenses	153,977	
Net revenue from auxiliary operations		22,030
Total net revenue from operations		$4,374,550
Non-operating revenues:		
Rental of real estate and buildings	$24,927	
Interest and discount	247,402	
Miscellaneous	1,731	
Total	$274,061	
Non-operating expenses	12,420	
Net revenue from other operations		261,640
Gross income		$4,636,191
Income charges:		
Items under agreement:		
Return of 6% on property valuation of $62,500,000	$3,750,000	
Return of 6% on additional capital for new property: $5,000,000 for 12 months	300,000	
1,200,000 for 8½ months	51,000	
Payments of city of Pittsburgh and other municipalities in lieu of licenses and paving assessments	352,969	
Amortization of debt discount and expense on additional capital	122,817	
Items not under agreement:		
Interest on judgments and settlements	116	
Rental of Seventeenth St. incline plane	7,155	
Total		$4,584,059
Net income for the year		$52,131

STATISTICS OF PITTSBURGH RAILWAYS

Miles of road		335.69
Miles of track		595.86
Carhouses		19
Car shops		2
Passenger cars—motor	1,339	
Passenger cars—trail	188	
Miscellaneous cars	276	
Total cars		1,803
Passengers carried—revenue		269,345,924
Passengers carried — revenue, transfer and pass rides based on the equivalent in regular fares		320,968,755
Estimated number of car rides, including revenue, transfer and pass passengers		370,412,204
Car-miles operated		39,688,609
Car-hours operated		4,766,548
Earnings per passenger car-mile—cents		54.32
Average fare per revenue passenger—cents		7.94
Average revenue per car ride—cents		5.77

SUMMARY OF INCOME AND PROFIT AND LOSS OF THE PITTSBURGH MOTOR COACH COMPANY FOR THE YEAR ENDED DEC. 31, 1925

Operating revenues		$90,207
Operating expenses:		
Maintenance of equipment	$23,267	
Traffic	2,146	
Transportation	34,937	
General and miscellaneous	11,863	
Depreciation	10,482	
Taxes	2,588	
Total		85,284
Net revenue from operations		$4,922
Non-operating revenue—interest and discount		38
Gross income		$4,960
Income charge—interest on unfunded debt		1,916
Net income for the year		$3,043
Deductions from surplus—miscellaneous		15
Surplus, Dec. 31, 1925—per balance sheet		$3,028

STATISTICS OF PITTSBURGH MOTOR COACH COMPANY

Routes operated	3
Coaches owned	22
Coach-miles operated	193,867
Coach-hours operated	18,929
Passengers carried	338,387
Earnings per coach-mile, cents	41.67

of improvements during the year both in operations and in additions to facilities. An outstanding improvement was in the rerouting which was effected in the downtown district, reducing overlapping. In the safety work, too, there was an improvement, resulting in a decrease of 5.45 per cent in the total number of accidents.

In April the company sold on excellent terms $1,200,000 of 6 per cent car trust bonds, series B. These bonds were taken by the public at a premium. With the proceeds 103 street cars were purchased. These cars were delivered late in the year. While continued study is being made of the problem of refunding and readjusting the capitalization of the railway system no plan is yet ready to be offered security holders. The holders of 88.8 per cent of the $2,187,000 matured bonds of thirteen underlying railways are co-operating generously by accepting meantime a continuation of the respective mortgage rates of interest.

During the year, through purchases out of funds available with trustees, derived from sales of property, underlying bonds to the amount of $219,000 were retired. Continuing the plan of eliminating subsidiary corporations where practicable several companies were closed out or merged with others.

On the subject of public relations the report says that undoubtedly the courtesy of trainmen, continuous advertising and dissemination of facts about the Pittsburgh district in general and street railway problems in particular, as well as the many appearances of officers before civic and trade organizations, have tended to bring about a closer understanding not only between passengers and personnel, but have continued to strengthen friendly relations with the general public.

President Thompson refers to the fact that the company won for the fiscal year ended Aug. 1, 1925, the award presented by the Charles A. Coffin Foundation "for distinguished contribution to the development of electric transportation for the convenience of the public and the benefit of the industry." In awarding the medal, the committee made it known that briefs of accomplishments were submitted in the contest by thirteen companies.

The accompanying tables contain statistics as well as income accounts of the railways and its bus subsidiary.

The Pittsburgh Motor Coach Company was chartered for the purpose of meeting a demand for this type of transportation. It began operations on Aug. 14, 1925, by taking over several independent companies, and on Aug. 17, 1925, established a new route between the downtown and Squirrel Hill sections of Pittsburgh. It also received a certificate of public convenience from the Public Service Commission of Pennsylvania for a route from downtown to the Point Breeze section of Pittsburgh, which will serve a high class residential district.

Petition for Discontinuance Allowed.—The Northern States Power Company has been authorized by the City Council of Eau Claire, Wis., to discontinue its interurban line between that city and Chippewa Falls and to tear up its tracks. Having secured the permission of the City Council of Chippewa Falls the company will now go before the commission for final permission.

Deficit of $210,355 in Buffalo

For the year ended Dec. 31, 1925, the International Railway, Buffalo, N. Y., reports a deficit of $210,355, against a deficit of $666,513 in 1924. The accompanying table shows the income account for 1925 compared with 1924.

INCOME ACCOUNT OF THE INTERNATIONAL RAILWAY FOR THE YEARS ENDED DEC. 31, 1925 AND 1924

	1925	1924
Passenger revenue	$10,357,800	$9,933,923
Other revenue	337,895	342,406
Operating revenue	$10,695,695	$10,276,330
Way and structures, equipment and power:		
Maintenance	1,505,072	1,647,992
Depreciation and renewals	1,016,000	1,016,000
	$2,521,072	$2,663,992
Power operation	634,890	646,057
Conducting transportation	3,235,793	3,421,455
General and miscellaneous	2,303,641	2,079,197
Taxes	712,704	698,642
Operation and taxes	$9,408,102	$9,509,345
Operating income	$1,287,592	$766,984
Non-operating income	48,094	46,225
Gross income	$1,335,686	$813,210
Interest	$1,434,943	*$1,362,781
Rentals	61,962	52,465
Amortization and discount	49,136	64,476
Income deductions or fixed charges	$1,546,041	$1,479,723
Deficit	$210,354	$666,513

* $87,106 credited to fixed charges, being the amount contributed by I. R. C. stockholders.

Earnings at San Diego for 1925 Decline

The San Diego Electric Railway, San Diego, Cal., reports to the Railroad Commission its 1925 operating revenue at $1,608,501, compared with $1,482,831 for 1924. The operating expenses, excluding taxes, for 1925 were $1,405,130 and for 1924 $1,220,041, leaving net operating revenue of $203,371 for 1925 and $262,790 for 1924. During 1925 taxes were $106,583 and for 1924 they were $100,492. Deducting the taxes leaves operating income of $96,788 for 1925 and $162,297 for 1924. Adding to the operating income the non-operating income of the company results in a gross corporate income of $175,822 for 1925 available for interest, amortization of debt, discount, other fixed charges, non-operating expenses, dividends and surplus. This compares with $220,355 for 1924 for similar purposes.

Seeks to Abandon Unprofitable Trackage.—The Alabama Power Company proposes to abandon that portion of its Pickett Springs car line in Montgomery, Ala., which extends beyond the Montgomery state fair grounds. The distance which the company plans to dismantle and remove will be approximately 3,200 ft. It is the contention of the company that the portion of trackage sought to be abandoned is not profitable.

Small Abandonments in Mount Vernon.—The Westchester Electric Railroad, New York, on April 9 applied to the Public Service Commission for permission to abandon two small sections of its route in the city of Mount Vernon. In one of these cases the city contemplates widening the street and is willing to have the tracks removed. There is no demand for railway service there, it is said.

May Abandon Two-Mile Line.—It is understood that the stockholders of the Batavia Traction Company, Batavia, N. Y., are considering the abandonment of the trolley system and putting in a bus line. The Batavia Traction Company operates 2 miles of line.

Revenue Lower in Santa Rosa.—The Petaluma & Santa Rosa Railroad, operating in Santa Rosa, Cal., and vicinity, reports to the Railroad Commission its 1925 operating revenue at $567,695, compared with $605,332 for 1924. The operating expenses, excluding taxes, for 1925 are reported at $431,764 and at $450,797 for 1924, leaving net operating revenue of $135,930 for 1925 and $154,534 for 1924. During 1925 taxes amounted to $26,799 and for 1924 to $28,581. Deducting the taxes leaves operating income of $109,131 for 1925 and $125,953 for 1924. Adding to the operating income the non-operating income of the company results in a gross corporate income available for interest and surplus of $116,024 for 1925 and $129,810 for 1924.

Income Higher in 1925.—Nearly $50,000 increase in net operating income of the Bamberger Electric Railroad, Salt Lake City, Utah, for 1925 over 1924 is reported by the company in its annual report filed with the Public Utilities Commission of Utah. Its profit and loss schedule is fixed at $548,621, or a decrease of $72,157 over the preceding year. The net operating income was $135,545. This was an increase of $47,865 over 1924. Transportation operation brought in a revenue of $577,411, to which should be added $6,163 revenues from other sources, giving a total of $583,574, with operating expenses of $444,030, a decrease of $23,345 over 1924. The investment in roadbed and equipment is $3,629,182. The company operates 73.21 miles of road.

Abandonment Petition Withdrawn.—The long-heralded plan of the Wisconsin Traction, Light, Heat & Power Company to abandon its interurban line connecting Neenah, Menasha and Appleton, Wis., was dropped suddenly when the Railroad Commission approved the company's request for the withdrawal of its abandonment petition made in October, 1925. Agreement with the commission, company and city representatives over the question of new bridges which were to be built by Neenah and Menasha over the Fox River, a substantial part of their cost to be borne by the railway, was responsible for the willingness of the company to continue this line. In its abandonment petition the railway contended that its fast-declining revenues, due to the private automobile and bus competition, would not allow it to share in the cost of any new bridges and recommended that no provision whatever should be made for the accommodation of its tracks in the design of the new bridges.

Personal Items

M. B. Rosevear Leaves Public Service

M. B. Rosevear has resigned as superintendent of distribution of the Public Service Railway, Newark, N. J. Mr. Rosevear's record with that company covers a period of eighteen years. He went with the company as a cadet engineer in 1908. He was the first young man hired for the railway under the cadet system.

At that time the cadet course was arranged to cover a period of two years of training in the various departments

M. B. Rosevear

of the company, but Mr. Rosevear extended his period of apprenticeship over 2½ years. He served in the transportation, the track, the line and in the electric generation and distribution departments.

On Jan. 1, 1911, he was made assistant to E. J. Dunne, the superintendent of distribution. Mr. Dunne died in 1914 and Mr. Rosevear succeeded to the duties which he had performed, a few months later Mr. Rosevear being made superintendent of distribution.

Ever since that time he has been in charge of the entire railway power distribution system. This work has covered not only maintenance and construction but financial responsibility and the handling of the personnel of this state-wide system. No sooner had Mr. Rosevear succeeded Mr. Dunne than the World War threw upon the whole Public Service organization many added responsibilities, among them the need for extensions to the system.

At Cornell he had constantly reiterated to him the need for the engineer who hoped to keep abreast of the times to participate in the proceedings and the work of the engineering societies. It was good advice, and Mr. Rosevear followed it. In 1919 he was a member of the power distribution committee of the American Electric Railway Engineering Association. Later he was made chairman of that committee and served in that capacity for two years. For the last three years he has served on the engineering executive committee. He has taken an active interest in the projects of the American Engineering Standards Committee and represented the American Electric Railway Association on certain technical committees dealing particularly with the subject of wire and cable standardization. He is also a member of the sectional committee dealing with the revision of the National Electrical Safety Code.

The whole course of Mr. Rosevear's experience has been so directed on the combined railway and the power and light system in New Jersey as to qualify him eminently not only in the line of work in which he has been engaged but in electric light and power distribution and as an executive. His plans for the future are not fully matured.

T. N. McCarter a United Gas Improvement Director

Thomas N. McCarter, president of the Public Service Corporation of New Jersey, has been elected a director of the United Gas Improvement Company, Philadelphia, to succeed the late Randal Morgan. Mr. Morgan was president of the Philadelphia company at the time of his death, but no announcement has been made of a successor to him in that post.

Directors of the Public Service Electric & Gas Company, a Public Service Corporation subsidiary, announced the election of Richard R. Young as vice-president in charge of sales. F. Milton Ludlow, stock transfer clerk of the Public Service Production Company, has been elected assistant treasurer, and Ivan L. Gulick, auditor, has been made general auditor.

E. H. Sniffin and T. J. Pace Assume New Responsibilities

Culminating in a reorganization of the Westinghouse Electric & Manufacturing Company sales system, which has been in course of development for some time, E. H. Sniffin, formerly manager of the power department, was made assistant to the vice-president, and T. J. Pace, formerly manager of the supply department, became director of sales. The announcement of these appointments, as well as a number of others affecting departmental sales managers, was made in the issue of ELECTRIC RAILWAY JOURNAL for April 3.

E. H. Sniffin

Mr. Sniffin, newly appointed assistant to the vice-president, became prominent as commercial aide to George Westinghouse, founder of the Westinghouse Company. He is one of three men who are directly responsible for the introduction of the steam turbine to the United States. His whole career has been closely bound up with the Westinghouse destinies. In his sixteenth year he became a stenographer in the New York offices of Westinghouse, Church, Kerr & Company, who were, at that time, sole agents for the Westinghouse Machine Company. Not long content with a purely routine job,

T. J. Pace

he devoted spare moments to the study of mechanical engineering and at the age of 22 became a salesman of power plant equipment. He was not long in impressing the force of his personality upon his associates and in 1900 was made sales manager of the company he had joined as a stenagrapher.

Further advances were not slow in materializing. Three years later he was appointed sales manager of the Westinghouse Machine Company and in 1906 became vice-president in charge of sales for the company. When the electric company absorbed the machine company in 1915 Mr. Sniffin was made manager of the power sales department. He has held that position until his most recent promotion was announced.

The new director of sales, Mr. Pace, has held the position of manager of the supply department since 1922. He became associated with the Westinghouse interest in 1899, when he was engaged by the Manhattan General Construction Company, Newark, N. J., owned at that time by George Westinghouse. During the latter part of the three years Mr. Pace was with the Manhattan Company he held the position of assistant to the general manager. In 1902 the Manhattan Company was purchased by the Westinghouse Electric Company. At that time Mr. Pace forsook the purely constructive enterprises which had characterized his activities previously. He moved to East Pittsburgh and was placed in charge of illuminating apparatus in the detail

and supply correspondence department. Three years later he was made manager of what was termed the illuminating and rectifier sections. From the former detail and supply department appeared an outgrowth known as the supply sales department, and in 1915 Mr. Pace was made assistant to the manager of this department. Only five years elapsed and Mr. Pace was assistant manager of his department, a position he held until 1922, when he was appointed manager.

F. D. Gordon Heads New England Street Railway Club

For the second time within a period of five years the railway men of the New England territory are congratulating Frederick D. Gordon. The occasion this time is his election as president of the New England Street Railway Club,

F. D. Gordon

which took place at the meeting in Boston on March 26. The other time they rejoiced with him was in January, 1921, when he assumed the general managership of the Cumberland County Power & Light Company, Portland, Me.

Mr. Gordon entered the public utility business in the power and light department in 1896, and has been associated with public utilities for 30 years. He was manager of the Androscoggin Electric Company, which operates an interurban railroad between Portland and Lewiston, Me., for fifteen years, and has been general manager for six years of the Cumberland County Power & Light Company, which operates the Portland Street Railway.

As general manager of the latter property he succeeded A. H. Ford. In this capacity he has had charge of a system capitalized at more than $2,000,000 and serving a population of 100,000 people. The railway department of the company operates 106 miles of track, including a number of interurban lines.

Mr. Gordon is regarded as one of the most efficient railway operators in New England. He was born in the town of Readfield, Me., in 1876.

Thomas E. Mitten, chairman of the board of the Philadelphia Rapid Transit Company, Philadelphia, Pa., has sailed for Europe. He intends to visit England, France, Germany and Austria, studying taxicab operation in London, Paris and Berlin. Other than this the trip is purely for pleasure. He is accompanied by A. G. Mitten.

H. A. Hegeman and W. C. Peters Are Advanced

Harold A. Hegeman accedes to the position of first vice-president and treasurer of the National Railway Appliance Company, New York, N. Y., while W. C. Peters assumes the duties of vice-president in charge of sales and engineering, following the resignation from the former office of Charles C. Castle.

Mr. Hegeman is well qualified by a long and varied experience in the railway field to undertake the responsibilities of his new office. His is no mere smattering of knowledge regarding the complexities of electric railway practice. He served an arduous apprenticeship in the shops of the New York & Queens County Railway, passing through the mechanical and maintenance of way departments, before taking a position with the United States Metal & Manufacturing Company as salesman. Later that company was liquidated and the railway end was succeeded by the National Railway Appliance Company. Mr. Hegeman became vice-president and treasurer of that concern in 1917. That office has been his until his recent election to be first vice-president.

Prior to his service with the New York & Queens County Railway Mr. Hegeman was affiliated with the Ingersoll-Rand Company in its pneumatic hammer department. In fact it was with this firm that his business career started. He entered the shops, but later served in the sales end of the company. Mr. Hegeman is a member of many transportation clubs and similar organizations, among them the New England Street Railway Club, the New England Railroad Club, the New York Railroad Club, the Central Railway Club, the American Electric Railway Association and the Metropolitan Section, A.E.R.A. He is also a member of the Engineers Club of Boston, Mass.

Mr. Peters became affiliated with the National Railway Appliance Company in April, 1920, as manager of the New England department. His not-to-be-gainsaid abilities in sales and engineering work soon led to his appointment as manager of all sales and engineering activities of the company. His recent elevation to the vice-presidency is but fitting tribute to the qualities of executive leadership which the passing years have discovered.

Born on Sept. 29, 1891, at St. John, New Brunswick, Mr. Peters was educated at the English high school in Worcester, Mass., later taking the mechanical engineering course at Worcester Polytechnic Institute. He entered the employ of the Boston & Albany Railroad in June, 1911, as a special apprentice in the locomotive shops at West Springfield. He successively held positions as shop draftsman, foreman, safety appliance inspector, and then located in the office of

H. A. Hegeman

W. C. Peters

the superintendent of motive power and rolling stock at Boston as draftsman and assistant mechanical engineer.

Mr. Peters enlisted with the Fourteenth Engineers (light railway) in June, 1917, going overseas in July, 1917. He successively saw service on the Somme front, in the Château-Thierry sector and in all of the later major engagements of the United States forces. He returned to this country as a first lieutenant and was discharged in July, 1919. He is also a member of the railway and steam railroad clubs with which Mr. Hegeman is affiliated, is a member of the Society of Automotive Engineers and of the Engineers Club of Boston.

W. A. Bertke, assistant division manager of the Illinois Power & Light Corporation, Chicago, Ill., has been elected president of the Illinois State Gas Association.

Harold E. Bachman has been appointed acting superintendent of distribution of the Public Service Railway, Newark, N. J., to succeed M. B. Rosevear, resigned. Mr. Bachman has been with the company about six years. More recently he has been distribution engineer. Before that he was connected with the Interborough Rapid Transit Company, New York. Not all his experience has been in railway work,

for Mr. Bachman engaged in industrial work upon his graduation from Penn State College.

Obituary

John W. Shartel

A gray dawn broke for the residents of Oklahoma City, Okla., on April 14, occasioned by the death the day before of John W. Shartel, president and general manager of the Oklahoma Railway and co-receiver of that company. With his death there passed also a spirit of adventure, evidenced by his work in organizing this railway with 138 miles of city and interurban tracks. He shared with Anton H. Classen the honor for the excellent system of transportation which the people of Oklahoma City now enjoy. Each of these men in his respective field made the success of the enterprise possible. In the brief period of twenty years the city grew from a town of 15,000 to a city of 100,000 population. The local company was liberal in the building of new lines through unsettled territory and in securing much private right-of-way for terminals. In addition the company has been almost uniformly successful, which is mighty significant in view of the adverse conditions affecting electric railways everywhere during and since the war-time period.

Mr. Shartel was graduated from the Kansas Agricultural College, Manhattan, Kan. Following graduation he went to Topeka to study law and was admitted to the bar in 1885. He then practiced law in Topeka for a year and later went to Sedan, Kan. After serving three years there as county attorney he formed a partnership in 1890 with W. C. Hackney and practiced at Winfield, Kan., until Jan. 1, 1893, when he moved to Guthrie, Okla., where the firm of Asp, Shartel & Cottingham was formed. In 1898 Mr. Shartel went to Oklahoma City and became general attorney for the Choctaw, Oklahoma & Gulf Railroad, which position he held until 1901. Several years later he formed a law partnership with J. R. Keaton and Frank Wells. This connection continued until 1912, when he retired in order to devote his time to the Oklahoma Railway, which he had helped to organize in 1902 and which had grown meanwhile to such proportions that the conduct of the company's affairs required the greater part of his time. He was vice-president and general manager of the property for many years before assuming the presidency upon the death of Mr. Classen in 1923.

In 1920 he was elected president of the Oklahoma Utilities Association and the following year was re-elected to that office. Mr. Shartel was also a director of the Chamber of Commerce of the United States, representing the Fifth District. He was elected to this office at the last annual meeting of the chamber held in Washington in May, 1922.

Mr. Shartel was born in Harmonsburg, Pa., in 1862. When he was very young his parents moved to Missouri. There the man who later was to be a railroad pioneer in Oklahoma received his early education.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Gerard Swope Analyzes Labor Problem of General Electric

How the introduction of more automatic machinery and improved methods of manufacture have resulted in a reduction of prices of products of the General Electric Company, as well as higher wages for employees, is pointed out in a statement made public recently by Gerard Swope, president, in announcing figures of the company's business for the first three months of the present year. Mr. Swope said in part:

> A study of our largest factory, at Schenectady, where today 21,000 men and women are employed, indicates that supplementing the worker's skill by electrical power has enabled him to increase his earnings. This is along the lines that civilization has moved in the past. It has been the constant effort of man to produce the necessities of life in the least time and with the least effort.
>
> During the twelve-year period from 1914 to 1925 the cost of living increased about 68 per cent, while the average earnings of the workers (not the hourly rate, but the actual dollars they received each week) increased 107 per cent; in other words, more than doubled.
>
> Let us assume that the average earnings in 1914 were $20 per week and the average cost of living was $18 per week, leaving a margin over and above the cost of living of $2 per week, or 11 per cent. In 1925 the average income would be increased 107 per cent to $41.40 per week, while the cost of living would have increased 68 per cent to $30.24, leaving a margin of $11.16 per week, or 37 per cent over and above the cost of living.
>
> In this same period the electric power consumed in this plant, much of which is purchased from a public utility company operating hydro-electric plants, has also more than doubled—from 45,000,000 kw.-hr. in 1914 to 93,000,000 kw.-hr. in 1925, while the average number of workers increased 34 per cent. The product of this plant during the twelve years under review, measured in dollars, increased 179 per cent.

In concluding his statement, Mr. Swope declares that these figures show progress in the right direction. He believes that, with more power supplied to the worker, he produces more with less effort and is thereby enabled to earn more money and improve his standard of living.

Extensive Improvement Program for Tampa

The Tampa Electric Company, Tampa, Fla., plans an extension program of $2,000,000 and will not stop at that figure if conditions warrant further expenditures. Approximately $500,000 will be expended on the railway department. T. J. Hanlon, general manager, referring to the program, said that from 20 to 25 new street cars would be added this year on the Belmont Heights line. The order, which will be placed soon, will approximate an expenditure of $160,000. Eight new buses to be operated on East Broadway will be ordered soon at a cost of $64,000 and will be similar to those now in use throughout the city.

In addition the company is planning considerable trackwork. One project will be double tracking the Hyde Park line at an expenditure of $60,000. This work will be completed in about three weeks. Directors have approved a recommendation to double track Grand Central Avenue at a cost of $40,000. This project is awaiting the approval of the City Commission. Passing tracks to accommodate additional cars on Seventh Avenue, Nebraska Avenue and Belmont Heights lines will be installed at a cost of $25,000. The company's share toward the construction of the Fortune Street bridge is $75,000. This will include the laying of street car rails.

Under construction the company now has an automatic substation at Eighth Avenue and Tenth Street, costing $40,000. In addition to this work, a two-story addition is being constructed adjacent to the present building of the Tampa Electric Company and will be completed in July at a cost of $85,000.

Obstacles in the Path of Coal Legislation

Constitutionality is the big obstacle in the path of coal legislation. This was brought out clearly during the second week of the coal hearings before the committee on interstate and foreign commerce of the House of Representatives.

Chances of any legislation have been hurt by the differences of opinion among the members of the House as to what form the legislation should take. Each witness has a different plan and most of them are hostile to the other proposals. There is marked opposition to the creation of another "extravagant" government agency to deal with coal. There has been considerable crystallization of opinion against lodging the emergency powers with the President.

The point is made that under present conditions a strike among the soft coal workers would not interfere particularly with supply. Non-union operations have increased to the point where they can meet the country's requirements. All western Kentucky is now non-union. Only 5 per cent of West Virginia's production now comes from union mines. Indiana and the Pittsburgh district are developing production which is not under union control.

The position of the operators seems to be that the public is amply protected in the matter of bituminous coal supply, except possibly against strikes. The producing area is scattered widely. There is no semblance of monopoly or centralized control of production. As there now is no great probability that a coal strike could stop enough bituminous production to cause much trouble, the greater danger lies in the possibility of a railroad strike. Even that is be-

coming more remote, but the hearings before this same committee developed the fact clearly that no absolute assurance against strikes can be established. The feeling is that that situation can be controlled alone by public opinion. The conduct of the public during the last strike, it will be pointed out to the committee, has done more to discourage another anthracite strike than any legislation that could have been enacted for this purpose.

Action Now Pending in Detroit on Bus and Car Bids

Funds Have Been Requested from the City Council to Purchase Needed Rolling Stock Equipment—Several Financing Plans Suggested by Manufacturers

Five manufacturers submitted bids on Peter Witt type cars as specified by the Department of Street Railways, Detroit, Mich., and six companies bid on the light-weight type cars, in answer to the department's request for bids on from 150 to 300 street cars for replacements and additions to the D.S.R. equipment.

Bids were asked on a cash basis and also based on time payments. Each company submitted a cash bid and a bid on the seven-year payment plan, but no bids were received on the ten-year payment basis suggested by the department.

The following bids were received for cash tenders on Peter Witt type cars f.o.b. Detroit in accord with the department's specifications:

	Cars	Each
Osgood-Bradley Car Co., Worcester, Mass.	50	$17,792
J. G. Brill Co., Philadelphia, Pa.	150	$17,500
	300	$17,500
Cummings Car & Coach Co., Chicago, Ill.	50	$17,425
St. Louis Car Co., St. Louis, Mo.	150	$17,500
	300	$17,500
Cincinnati Car Co., Winton Place, Ohio	50	$17,675

The bids submitted on the Peter Witt type cars on the seven-year payment plan were as follows:

	Cars	Per Car per Month
Osgood-Bradley	50	$263.27
J. G. Brill	150	$258.93
Cummings Car & Coach	50	$257.82
St. Louis Car	100	$258.93
Cincinnati Car	50	$261.52

Numerous alternate proposals were submitted based upon cars with fixtures and equipment not in accordance with the regular specifications, which affected the price bid on the complete car, both on the cash basis and on the seven-year payment plan.

On the light-weight cars six bids were received on from 50 to 300 cars for cash tenders and 50 to 150 cars on the seven-year payment plan. The cash tenders were as follows:

	Cars	Each
Osgood-Bradley	50	$16,350
J. G. Brill	125	$16,000
	300	$16,000
Cummings Car & Coach	50	$15,886
St. Louis Car	125	$15,978
Cincinnati Car	50	$16,266
Light-Weight Noiseless	125	$16,000

The proposals submitted for the light-weight cars on the seven-year payment plan of 84 equal monthly payments were:

	Cars	Per Car per Month
Osgood-Bradley	50	$241.91
J. G. Brill	150	$236.75
Cummings Car & Coach	50	$235.00
St. Louis Car	125	$236.42
Cincinnati Car	50	$240.68
Light-Weight Noiseless	125	$287.60

In a letter to the City Council, written April 6, H. U. Wallace, general manager of the D. S. R., cited that the department had received the bids on 125 motor coaches and 150 street cars and requested an allowance in this year's budget of $4,000,000 for the purchase of the equipment—$1,670,000 for buses and $2,330,000 for street cars. He further cited that the D. S. R. has received cash bids on buses, one company offering a monthly plan which would extend over seven years, but with a restriction in the bid which provides that this monthly payment plan will be an unconditional obligation of the city of Detroit. This restriction is not practical, as the obligation will only be an obligation of the Street Railways.

The cash cost of 150 cars is $2,400,000. This is $70,000 more than is being asked in the budget, but the department can provide the $70,000 out of present funds. If this money is provided through budget allowance so that budget bonds can be issued and cash paid for the equipment the total cost of the street cars, including interest paid on bond money at 4½ per cent, will be $2,782,507, the letter states. If purchased on the time-payment plan as offered by the bidders, on equal monthly payments over a period of seven years, the equipment will cost $2,983,050. The increased cost of purchasing the equipment on the seven-year plan over the cash payment plan will amount to $200,542.

The cash cost of 125 buses is $1,670,000. If this money is provided through budget allowance so that the department can issue budget bonds and pay cash for the equipment the total cost of the coaches, including interest on bond money at 4½ per cent, will be $2,047,800. If purchased on the time-payment plan as offered by the bidder, on equal monthly payments over a period of seven years, the equipment will cost $2,226,950. The increased cost of purchasing the equipment on the seven-year plan over the cash payment plan will amount to $179,150.

Mr. Wallace said:

> It will be noted from the above that the total saving to the Department of Street Railways resulting from an issue of budget bonds to cover the purchase of this equipment will amount to $379,692.

The general manager recommended to the Council that this saving be taken into consideration with a view to authorizing bonds in the amount of the total cost of this equipment with a ten-year maturity. Speaking of the need for the new equipment Mr. Wallace said:

> We do not believe that sufficient service can be given to the people without the purchase of 125 gas-electric coaches and 150 street cars.

The D. S. R. is now renting approximately 60 street cars per day from the Detroit United Railways and during the past winter was unable, despite this emergency measure, to give satisfactory service owing to the lack of equipment. The general manager estimates that the department should have at least 150 cars to replace the cars now rented to take care of the business of the coming winter. 157 street cars are in operation that vary in age from 21 to 26 years. These cars are running on an average of 100 miles per day and the expense of maintenance on this equipment is growing daily. These cars are so old that they cannot be kept in condition to give the people satisfactory service without a very large expenditure of money, the general manager stated. The letter continues:

> By the purchase of the new cars we can set the old cars aside, using them only for tripper service, two hours in the morning and two hours at night. By putting these cars to this use we can utilize them for another year.

It is pointed out that the department's present coach service is very inadequate on lines now in operation, owing to shortage of coaches. It is very difficult to give the equipment proper attention in order to keep it in working order and there are a number of new lines that should be put on during the coming year to serve outlying districts. In addition, the general manager cited, coaches should be substituted for the service now being given on the Woodmere line, which is unsatisfactory, owing to the fact that the old car line on Porter Street is worn out and was abandoned more than a year ago.

That there is also a large demand for a new coach line on Fourteenth Street from the end of the pavement near Boston Boulevard into the center of the city is stated, and the opinion is expressed that it is absolutely necessary for the department to provide the equipment requested at this time.

Increased Fares Permit Akron Company to Purchase New Buses

In line with its avowed policy of providing an adequate co-ordinated transportation service to the city of Akron, Ohio, the Northern Ohio Traction & Light Company has just purchased twenty Safeway bus chassis and two complete double-deck buses from the Six-Wheel Company, Philadelphia, Pa. Bus operation in Akron has been conducted at a loss since its inauguration by the company due to franchise restrictions which made it impossible to impose an adequate fare. It was

finally suggested that the whole matter be laid before the people living in communities which would be served by the proposed new express bus line.

Neighborhood meetings were held in residential sections and petitions circulated in the factory districts. Practically no opposition was encountered, and in a short time a citizens' committee approached the City Council with petitions containing thousands of signatures asking that the railway company be compelled to institute an express bus service with a 10-cent fare. The net result of this agitation was the purchase of the equipment previously mentioned.

During the current year the Northern Ohio Traction & Light Company plans to spend approximately $500,000 on new buses, while $30,180 will be spent in rebuilding truck bus equipment. The Six-Wheel equipment just purchased will be used in express service to outlying sections of the city.

Specifications for Richmond Cars Were Misstated

A number of errors occurred in the list of specifications on fifteen cars now being built by the American Car Company for the Virginia Electric & Power Company, which was published in the issue of ELECTRIC RAILWAY JOURNAL for March 20. These items are herewith corrected:

Headlining	Haskelite
Curtain fixtures	National Lock Washer Company
Registers	No registers were installed on these cars
Sash fixtures	Schecter post casings without sash locks
Ventilators	Utility
Trucks	Brill 177-E-1
Special devices, etc.	Full safety devices

Southern Properties Order Light-Weight Cars

Orders for new rolling stock have just been placed with the Light-Weight Noiseless Electric Street Car Company, Chicago, Ill., by three Hodenpyl, Hardy properties. Ten double-end light-weight cars will be delivered to the Tennessee Electric Power Company, Chattanooga, Tenn.; ten cars of a similar type to the Nashville Railway & Light Company, and thirteen cars to the Southern Indiana Gas & Electric Company, Evansville, Ind. A portion of these latter cars will be double end, while the remainder will be of single-end construction. Delivery of all of the units is expected to be made in 120 days from the date of ordering.

Railway Motor Exports Decrease in February

While there was a slight decrease in the exports of railway motors during the month of February, this was more than balanced, from the standpoint of the electrical industry as a whole, by the increase in stationary motors of more than 200 hp. There was a considerable increase in the shipments of fractional horsepower motors and of stationary motors of from one to 200 hp. Shipments of accessories and parts for motors increased materially.

A marked increase was noted in the exports of electric locomotives, the total being $477,485 for February, 1926, as against $7,563 during February, 1925. Shipments of portable electric tools totaled $33,506 during February, as against $19,196 during January.

"900" Type Cars for Atlanta

Work has been started by the Cincinnati Car Company on an order for 60 new street cars received from the Georgia Railway & Power Company, Atlanta, Ga. As reported in ELECTRIC RAILWAY JOURNAL for March 27 the cars are similar in type to those already in operation on the Georgia company's lines and will seat 48 passengers. They are designed for double-end operation, the rear door being treadle operated. Provision will be made so that a street fare collector can open this door from the outside with a key. The clear height of the cars inside will be 7 ft. 11⅜ in. Specifications follow:

Weight	37,300 lb.
Length over all	45 ft. 4 in.
Post centers	29¼ in.
Truck wheelbase	5 ft. 4 in.
Width over eaves	8 ft. 3⅝ in.
Height, rail to trolley boards	11 ft. 2⅞ in.
Roof	Monitor
Air brakes	Westinghouse
Compressor	Westinghouse DH-16
Control	G. E. K-35-JJ
Curtain fixtures	Operator's vestibule curtains
Curtain material	Pantasote
Door-operating mechanism	National Pneumatic
Fenders	"Atlanta" type drop basket
Gears	G. E. A-1 long and short addendum tooth
Hand brakes	Peacock staffless
Heater equipment	Twelve Consolidated panel electric
Lightning arresters	Aluminum cell
Motors	Four G. E. 265-A, 35 hp.
Seats	Hale & Kilburn No. 400 reversible
Seating material	Springless canvas lined rattan
Slack adjuster	American Brake Co., E-1
Trucks	Brill No. 177-E-1 Stucki side bearings
Wheels	26 in. diameter
Special devices, etc.	Safety Car Devices double-end safety equipment

Haskelite Marketing Policy Cites Operating Facts

Selling operators of street cars and buses with cold facts has been the advertising policy of the Haskelite Manufacturing Corporation, Chicago, Ill., according to an article appearing in the March issue of *Class Industrial and Trade Advertising*. It was not sufficient, the Haskelite Corporation found, to make general statements as to the saving effected with Haskelite or Plymetl. To the companies in the electric railway field, therefore, it has stated definitely how Haskelite or Plymetl has been used, the exact number of pounds weight saved, and has ended by translating this into dollars. The article outlines the development of Haskelite products for use in transportation.

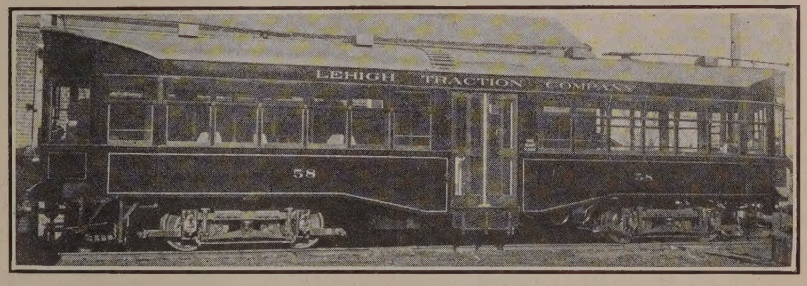
$196,268 Increase in Allis-Chalmers Net Earnings

A net profit of $3,417,368 after charges, depreciation and federal taxes is shown in the report for 1925 of the Allis-Chalmers Manufacturing Company. After preferred dividends this equals $8.78 a share earned on $25,770,750 of common stock. This compares with $3,221,100, or $8.01 a share, in 1924. The surplus, after dividends, for 1925 stood at $716,315, as against $1,035,461 in 1924.

The company had unfilled orders amounting to $10,147,073 on Dec. 31, as compared with $10,124,028 on Dec. 31, 1924.

Total sales for 1925 reached $28,921,357, as against $27,855,523 in 1924. Other income for the two years respectively was $689,666 and $632,504. Costs, depreciation, etc., reached $25,639,655 last year, while federal taxes were $554,000. In 1924 these figures were respectively $24,751,927 and $515,000.

Lehigh Cars on Modernized Trucks



In the early part of 1925 the Lehigh Traction Company, Hazleton, Pa., placed an order with the J. G. Brill Company, Philadelphia, for three complete cars mounted on Brill 27-MCB-1 trucks, duplicating trucks furnished the railway ten years ago. Ten all-steel bodies were also ordered to be mounted on modernized 27-E-1 trucks. A description of these trucks appeared in the issue of ELECTRIC RAILWAY JOURNAL for Jan. 16, 1926. General specifications on the cars follow:

Seating capacity	Smoker, 40; passengers, 30
Length over all	48 ft. 8 in.
Truck wheelbase	6 ft. 0 in.
Width over posts	9 ft. 0 in.
Height, rail to trolley board	11 ft. 8⅛ in.
Body	All steel
Interior trim	White enamel
Roof	Arched
Air brakes	Westinghouse
Bumpers	Hedley anti-climber
Car signal system	Buzzers
Compressor	G. E. CP-27-B
Control	G.E. type M, automatic features
Couplers	Tomlinson form and radial drawbar
Curtain fixtures	Rexall metal rollers
Curtain material	Pantasote 86 Morocco
Destination signs	Hunter illuminated
Door operating mechanism	National Pneumatic
Fenders	HB lifeguards
Heater equipment	National Railway Appliance
Headlights	Golden Glow RR28
Paint	Black with gold lettering
Sanders	Two Wyoming type, air operated
Seats	Longitudinal and transverse
Step treads	Irving
Trucks	Three Brill 27-MCB-1; ten 27-E-1
Ventilators	Railway Utility honeycombed

$2,587,422 Increase in G. E. Orders for Quarter

Orders received by the General Electric Company for the first three months of the present year totaled $86,433,658, Gerard Swope, president, has announced. This compares with $83,846,236 for the first three months of 1925, or an increase of 3 per cent.

Rolling Stock

Asheville Power & Light Company, Asheville, N. C., has received seven 29-passenger gas-electric buses from the Fageol company, Kent, Ohio. Two new street cars were also delivered recently by the J. G. Brill Company, Philadelphia, Pa. The new cars will be placed in service on the Grace-Biltmore line, while the buses will supplant the old equipment which has been in service between the city and West Asheville. The new buses are equipped with Westinghouse air brakes.

Stark Electric Railroad, Alliance, Ohio, ordered eight passenger interurban cars from Cincinnati Car Company on March 13. Following delivery, which is expected about June 15, the cars will be placed in interurban service between Canton and Salem, with limited service on the hour and local service on the half hour. Principal specifications are given here:

Seating capacity	52
Weight	32,500
Length over all	47 ft. 3 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8⅝ in.
Height, rail to trolley base	10 ft. 10½ in.
Body	All steel
Interior trim	Cherry
Headlining	Agasote
Roof	Arch
Air brakes	General Electric
Bumpers	Cincinnati Car Co.
Conduits and junction boxes	General Electric
Control	K-35 KK
Curtain material	Pantasote
Destination signs	Perforated sheet metal
Door operating mechanism	Pneumatic
Fare boxes	Cleveland
Hand brakes	Cincinnati Car Co.—staff brake
Heater equipment	Electric
Journal boxes	Pedestal type
Lightning arresters	General Electric
Motors	Four G.E. No. 265A, 35 hp.
Finish	Duco
Sanders	Cincinnati Car Co.
Seats	Transverse, non-reversible
Seating material	Leather in smoker —washable linen in passenger compartment
Slack adjuster	Turnbuckle
Springs	Combination elliptic and coil
Trolley retrievers	Ohio Brass
Trucks	Cincinnati Car Co.
Wheels	28 in.

Key System Transit Company, Oakland, Cal., has received the first six of an order of 40 new cars from the American Car Company, St. Louis, Mo., which are now being made ready for service in the shops at Oakland. Specifications on these cars were published in the issue of the ELECTRIC RAILWAY JOURNAL for Aug. 22, 1925.

Chicago Surface Lines, Chicago, Ill., is at present negotiating for the purchase of a number of new street cars.

Track and Line

Dallas Railway, Dallas, Tex., has extended its Mount Auburn car line for a distance of a quarter of a mile. The construction of the extension through new residential sections in the White Rock Lake district was financed by real estate developers at a cost of $20,000.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., will take up the tracks of the stub line between 47th Street and the cemetery to permit the city to proceed with paving improvements and the same district will also be tapped soon by another extension to the Center Street car line, taking in the now unserved territory between 51st Street and Lisbon Avenue. Construction on this extension will start just as soon as weather conditions permit. About 2,900 ft. of double track will be laid, at an estimated cost of $49,000.

Trade Notes

Robert W. Hunt Company, Ltd., has appointed its chemical engineer, F. O. Farey, manager of its Montreal office, but has made no change in the personnel of its offices at Toronto and Vancouver or in the conduct of its inspection and testing work.

R. M. Alvord has been appointed manager of the San Francisco office of the General Electric Company, according to an announcement by J. A. Cranston, Pacific Coast manager. Mr. Alvord succeeds E. O. Shreve, who recently was made manager of the industrial department of the company with headquarters in Schenectady.

Pierce-Arrow Motor Car Company, Buffalo, N. Y., announces that total shipment of all vehicles produced during March represents an increase of 33 per cent over the total shipment in March, 1925. Shipments for the first quarter of this year show an increase of 30 per cent over the same period of 1925. These figures cover passenger cars, heavy-duty trucks and Pierce-Arrow buses.

Electric Service Supplies Company, Philadelphia, Pa., has announced the removal of its Pittsburgh office from Room 829 Oliver Building to Room 1123 Bessemer Building. The move was made necessary by the demand for new and larger quarters.

New Advertising Literature

National Automobile Chamber of Commerce, 366 Madison Avenue, New York, N. Y., has issued general bulletin No. G1053, listing price changes for passenger cars, motor trucks, motor buses and taxicabs since March 15, 1925. Prices of all new models that have been brought out in that time are also indicated.

North American Cement Corporation, Hagerstown, Md., has issued a booklet entitled "Quick-Hardening Concrete." This is a practical consideration of products, methods, results and costs involved in the use of Cal-Concrete. Among the subjects discussed in this publication are the effect of acceierators on the strength of concrete, the effect of curing, and of the water ratio on the strength of the product, aids in waterproofing, intensifying, etc.

Bridgeport Brass Company, Bridgeport, Conn., has issued a leaflet setting forth the merits of its new traffic spots for permanent marking of traffic directions. It is pointed out that the Bridgeport Brass cup markers are permanent, while paint markings on the road or highway soon wear off and must be renewed.

ELECTRIC RAILWAY MATERIAL PRICES—April 13, 1926

Metals—New York

Copper, electrolytic, cents per lb.	13.95
Lead, cents per lb.	8 00
Nickel, cents per lb.	35 00
Zinc, cents per lb.	7 50
Tin, Straits, cents per lb.	63 75
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	56 00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.225
Somerset mine run, Boston	1.95
Pittsburgh mine run, Pittsburgh	1.95
Franklin, Ill., screenings, Chicago	1.875
Central, Ill., screenings, Chicago	1 325
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.95
Tie plates (flat type), cents per lb.	2.30
Angle bars, cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.25
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	$1.35

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (28 gage), cents per lb.	3.25
Sheet iron, galvanized (28 gage), cents per lb.	4.50
Galvanized barbed wire, cents per lb.	3 35
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	12–18
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–17.50
Colored	10–14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	11.00
White lead in oil (100 lb. keg), cents per lb.	15.50
Turpentine (bbl. lots), per gal.	$0.98
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4–6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	16.00
Rubber-covered wire, No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, cents per lb.	18.00

Paving Materials

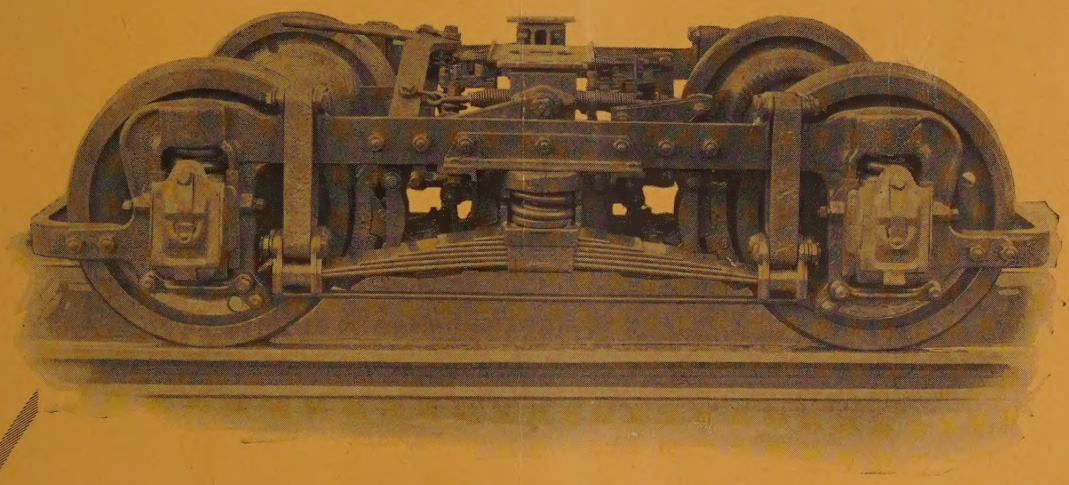
Paving stone, granite, 5 in. New York—Grade 1, per thousand	$147
Wood block paving 3½, 16 lb. treatment, N. Y., per sq. yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu. yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, ¾-in., cu. yd., f.o.b. N. Y.	1.75
Sand, cu. yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11 625
Light copper, cents per lb.	9 625
Heavy brass, cents per lb.	7 25
Zinc, old scrap, cents per lb.	4 625
Lead, cents per lb. (heavy)	7 00
Steel car axles, Chicago, net ton	$17 75
Cast iron car wheels, Chicago, gross ton	16 75
Rails (short), Chicago, gross ton	17 75
Rails (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	8.50

Brill No. 177-E-1 Truck

introduced under new cars in Providence



Twenty-five one-man, two-man cars mounted on Brill Light-Weight Trucks

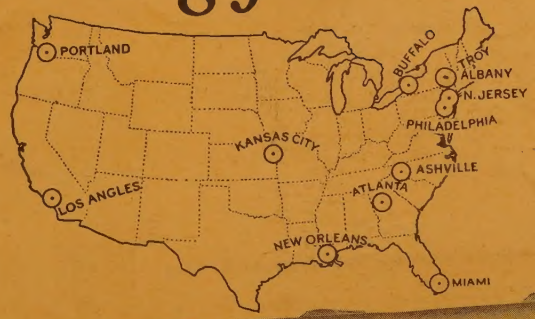
Light in weight, yet possessing qualifications which insure long life and minimum maintenance, the Brill No. 177-E-1, Type Truck, specified by the United Electric Railways, Providence, R. I., for its twenty-five new cars built by Wason, was specially developed for light weight cars.

While it generally conforms in design to the popular No. 77-E inside-hung motor type, including the Brill Graduated Spring System and Bolster Guide, its solid-forged sideframes were specially designed to reduce weight. It is important to note that this has been accomplished without sacrificing strength, a feature of all Brill truck frames.

Brill Twin Links, which retain smooth and comfortable riding action on uneven track and under the higher rates of speed, were also specified.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Accepted everywhere -and growing fast



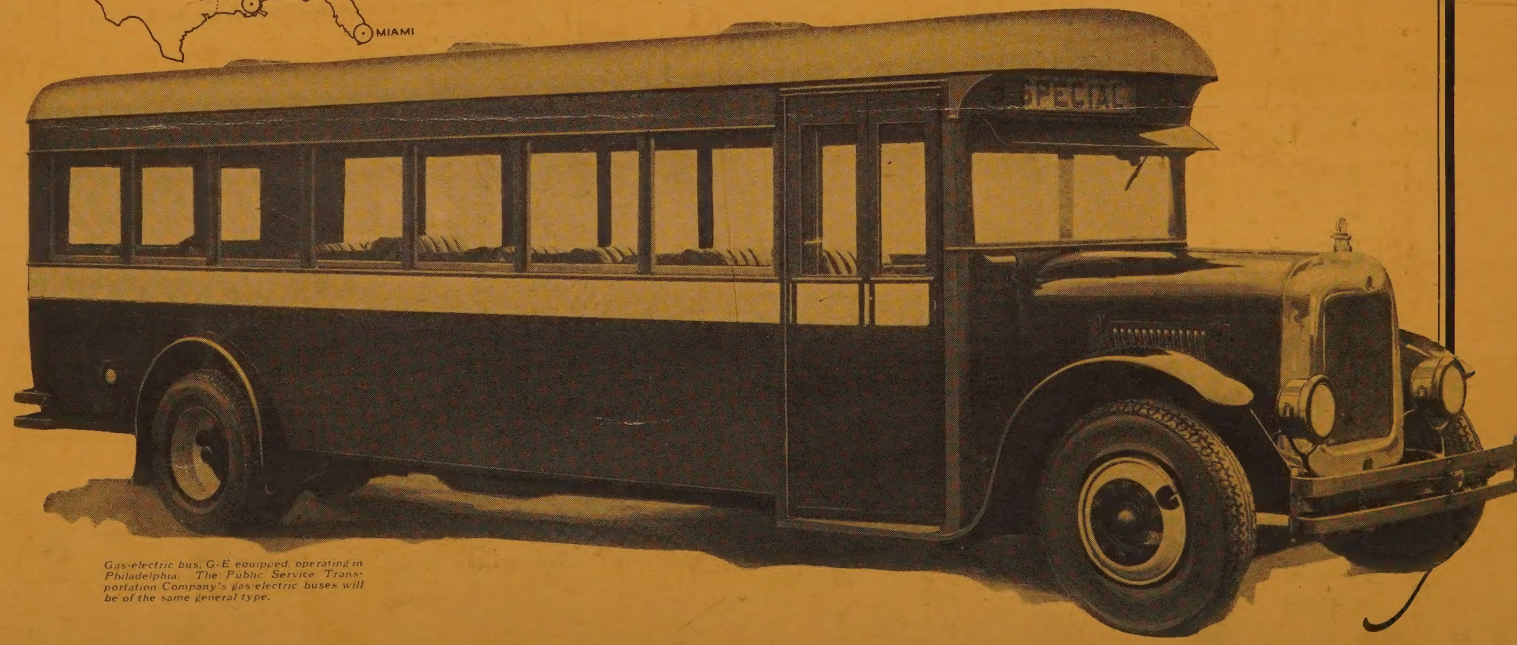
333 Gas-Electrics in one order

On the market less than a year, General Electric gas-electric bus equipment is being preferred from coast to coast. Already there are twelve installations in operation or on order; more purchases are under negotiation.

As the climax to an outstanding first-year success, the Public Service Transportation Company of New Jersey recently placed the largest single bus order on record—333 Gas-Electrics, all to be G-E equipped.

Electric drive was decided upon only after the executives of the Public Service mechanical, electrical, and transportation departments had made a most thorough investigation and satisfied themselves as to its superiority. Every type of bus and of bus equipment offered was first exhaustively tested, on the road and in the shop.

Wherever it has been adopted, G-E Electric Drive is achieving faster schedules, smoother riding, safer operation, and easier handling —and it can be obtained on practically any standard chassis.



Gas-electric bus, G-E equipped, operating in Philadelphia. The Public Service Transportation Company's gas-electric buses will be of the same general type.

Complete facilities for design, experimentation, and manufacture are essential to success such as has attended G-E Electric Drive for buses. Consult our representatives before deciding upon the type of bus for your requirements. G-E branch offices are in every large city.

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, NEW YORK

SALES OFFICES IN ALL PRINCIPAL CITIES

190-6